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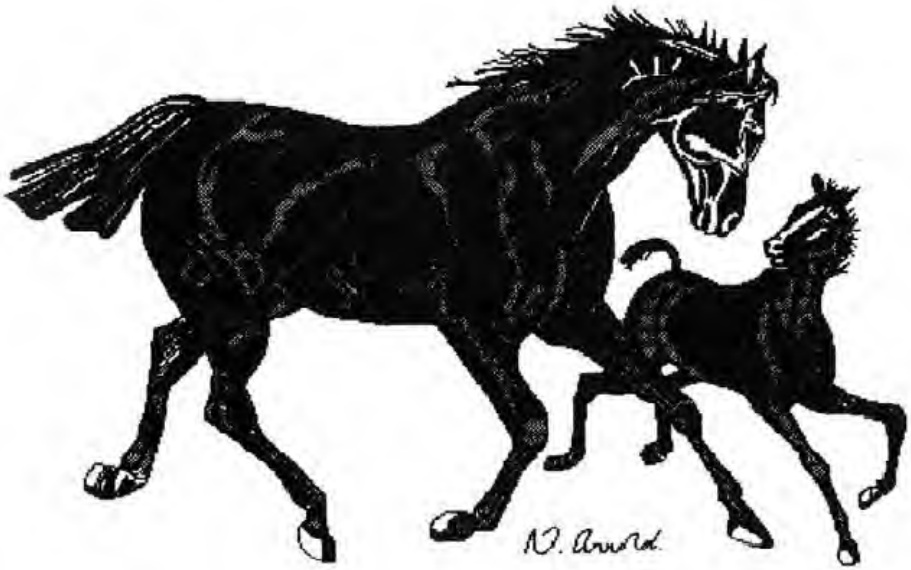

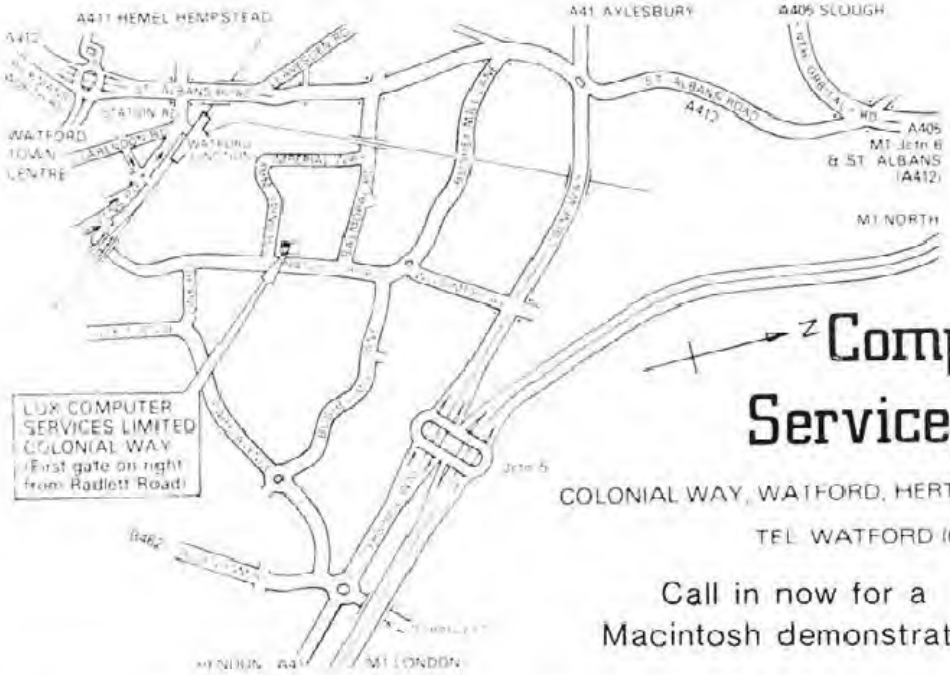

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INTERNATIONAL APPLE CORE ™

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Editorial

Many thanks to those of you who have replied to our printer cards survey. We expect to have the results in the next issue. If any of you just hadn't got around to sending in, please do it now. The more data we have, the better the final analysis.

At a recent exhibition there was a demonstration of Appleworks. Several children watched the whole thing from beginning to end with great interest. Who says children only want to look at games?

We recently reviewed a book called "CP/M and the personal computer". The publishers told us the price was £10.95 but on two separate occasions this book has been seen in shops at £19.95. It seems there was a typing error in the publisher's information so if you are intending buying this book be prepared to pay the higher price.

While on the subject of books, we are on the lookout for people to review books on interfacing and generally connecting the Apple to the outside world. It seems that few people know about this area so if you are one of the few (even if not an expert) and would like to review a book on it, please let me know on [illegible].

This issue sees the start of our series on Artificial Intelligence. Next issue it will deal with Expert Systems. It is a complex but extremely fascinating subject. You may find you have to re-read the article a couple of times but it is well worth the effort.

Contributions to Hardcore are always welcome. Obviously, we prefer these on disk (unless it is just a short note) but if you can't manage that, we will accept the written word. Don't let a mere technicality stop you writing. If you need advice just ask. I look forward to hearing from you.

S.I.G.'s

Spreadsheet SIG

We are starting up a Spreadsheet SIG. Anyone interested in this, please contact Fran Teo on Bracknell [illegible].

Chairman's Corner

Those of you who have been members of BASUG for any time will know the name of Tony Williams. One of the first members of the club, Tony has worn many hats. I first met him when he was membership secretary. One Sunday meeting at Parkstreet was punctuated by the Apple turning disks on and off as a sort was done on the database. I think the program being used was 'Filing Cabinet', a Basic program from the Apple contributed software library, and the sort took upwards of 4 hrs. The software on the Apple has come a long way since then.

Tony had always been involved with Hardcore, and in mid-1982, he took over as Editor. His inimitable style (and the fact that he knew about grammer an' fings), not to mention his daisy wheel printer marked his time as Editor. The pressure of making a living finally told, and after a spell as treasurer, he became Press officer. Sadly the pressure of work has meant that he has had to resign from the committee where he will be greatly missed. I'm sure that all will join me in wishing him success and thanking him for his great efforts for the club (Will someone please tell Tony, as he won't see this, his membership is overdue!).

On the Apple front it has just been announced that the development team for Apple /// has been disbanded. This must mean that the model will be allowed to die a natural death. The introduction of the 128k //e and Prodos, which allows a Profile hard disk to be used, means that most people who might have needed a /// will buy a //e. The //c's introduction is an exciting event, and confirms Apple's commitment to the 6502 machine. Rumours in the press of a //x, 8/16 bit machine later in the year, or early next, look very promising too.

BASUG also moves forward, welcoming 2 new members who have ordered Macintoshes, although the latest is that availability in the UK is going to be further delayed. There seems little doubt that this will be a great machine, but unless they are in the market, the battle against IBM will be made much harder. (It would be interesting to know the comparative world wide sales for boards to make Apples IBM compatible and vice versa): Has anyone tried one of these MS DOS boards for Apples?

Artificial Intelligence

by Leo Crossfield

Department of Educational Studies
University of Surrey
April 1984

INTRODUCTION.

This article gives an overview of artificial intelligence (AI) with the aim of offering a general background to what AI is and the nature of the academic environment in which it developed. A number of problems are also covered which are associated with the nature of 'intelligence', and have been used by some of the critics of AI to undermine its research claims.

The reader is offered this background so that future articles can concentrate upon AI techniques and developments within an historical context. There is also a need to outline the tradition that AI has developed from, for the language of the AI community often creates a dis-chord in some humanists who tend to cry with indignation when AI researchers explain the behaviour of their programs in mentalist terms. They suggest that the psychological vocabulary such as 'understanding', 'knowing', 'intentionality' and 'the capability of learning', are cognitive activities which are specific to the domain of living systems. With the criticism being that to use such a vocabulary to describe the behaviour of a machine is to unnecessarily anthropomorphise the machine.

The emphasis of the machine as a cognitive system strikes many dis-chords but it was not too long ago that the dominant paradigm of behaviourist psychology (which was headed by the American psychologist Skinner) offered a mechanistic view of psychology which refused to interpret behaviour in terms of conceptual schemes. This paradigm had a powerful and firm grip on the human sciences, suggesting that all mental activities could be explained by behaviour and that any mentalist term was at best a shorthand label.

Therefore the behaviourist tradition did not allow talk of unobservable cognitive activities, but rather offered a mechanistic view that living entities could be observed as black boxes which had only input/output observables; namely behaviour. Consequently this paper, as well as introducing the reader to the development of AI, also introduces a number of developments which assisted the move away from the behaviourist tradition. The need to speak of 'understanding' as an intelligent activity was paramount to the early traditions from which AI developed.

WHAT IS ARTIFICIAL INTELLIGENCE?.

Artificial intelligence could be defined as a research effort which attempts to understand the human cognitive processes by developing models in the form of computer programs. Minsky (1968) terms AI as "...the science of making machines do things that would require intelligence if done by men".

The term 'artificial intelligence' was first used by McCarthy in the early 1950s, and since that time the actual term has created many problems because the concepts of 'artificial' and 'intelligence' are by their very nature problematic.

A PROBLEM OF SEMANTICS.

The dictionary definition of the term 'artificial' suggests that it is "made by human skill; insincere, shallow, not genuine nor natural". As Simon (1969) suggests "our language seems to reflect man's deep distrust for his own products".

The concept of 'intelligence' has been a continuous source of argument in the human sciences. With both philosophy and psychology investigating notions which are generally assumed to be related to intelligence, such as intentionality, understanding, belief, morality, knowledge, learning, teaching, wisdom, etc. Consequently, the concept of intelligence is loaded, for we all feel that intelligence is the essence which separates mankind from the animal kingdom. Intelligence therefore allows mankind to take a special prestigious position on this planet for it has been the basis from which mankind has been able to develop complex cultures, sciences and philosophies, and yet, it is also the base for all of man's social, political and prejudicial problems.

It is, of course, impossible to define the nature of intelligence in one paragraph, but

it is important to outline that our intuitive understanding of what constitutes intelligence is often insufficient. For we rarely consider the act of walking and the act of problem solving as both constituting intelligent behaviour, but we would consider the act of walking as an intelligent activity if it was driven by some form of purpose, for instance, to move across a room to make a telephone call. Yet the problems that are involved in the co-ordination of basic motor skills are a fundamental area of interest to many AI researchers.

Perhaps the problems that are inherent in the nature of intelligence are created by the generality and undefinable nature of the term. But although intelligence operates on many levels, it can perhaps be best defined as any action which is governed by intentionality. And we then find ourselves in the realm of philsophy. Some philosphers have taken this argument to suggest that machines, as symbol manipulating mechanisms, can never have intentionality no matter how cleverly programmed. Searle's (1980) arguments are specific on this point, and Hartley (1980) has suggested that it does not help us to speak of intelligence in machines, but rather we should speak of 'competence'. His argument suggests that using the term 'intelligence' in machines is counter productive for it creates too many issues that are unsurmountable. The term 'competence' being a more neutral term which can be sensibly applied to developing machines which model human areas of competence.

Also, problems which arise by using the term of intelligence as intentionality raise the issue of mind. Is it necessary to have a mind to be capable of exhibiting intelligent behaviour? On an intuitive level one would perhaps suggest that it is, but then we are deeply embedded within the philosophical tradition of the dualist theories of mind and body; and more recently mind and brain. The arguments in this area suggest that the concept of mind is a pre-requisite for intelligence, and exists as some form of spiritual entity which is somehow in control of the brain; counter arguments suggesting that what we intuitively consider as mind is nothing more than the consequence of the brains complex activities. A reasonable analogy for this counter argument has been put forward that mind can be considered as a process which relates to the brain in a similar manner to digestion relating to the stomach.

We can see from this brief and general discussion that the term 'intelligence' can take us quickly into deep philosophical discussion, perhaps never to re-emerge, let alone do any interesting research. But we are still left with a problem of semantics. At this stage it is sufficient to suggest that an analysis of the terms 'artificial' and 'intelligence' does not really produce any form of understanding of what is encompassed in AI research.

The early founders of AI, perhaps fell into the same trap as the early psychologists who attempted to devise a simple single test of intelligence. Similarly, some of the founders of AI hoped that it would be possible to develop a large program in a massive computer which could become intelligent in a manner similar to man.

I have attempted to outline a few of the countless arguments which surround the nature of intelligence which I feel offer some reasons why perhaps the term 'artificial intelligence' can be considered as an unfortunate terminology for a science which is growing in importance and which will inevitably effect many diverse disciplines. Western civilisation is moving at an exponential rate into a world which is dominated by Information Technology (IT), and within this context I suggest that the research area of AI will inevitably have profound effects upon our future.

This paper so far has offered a very brief introdution to some of the philosophical difficulties which surround the AI community - namely the difficulty of semantics and terminology. A suggestion has been made for the importance of AI research in the future, but to balance this initial introduction it is necessary to look at the history of events which gave rise to the development of this new science.

THE BACKGROUND OF AI.

The emergence of cybernetics, in the 1940s, used general engineering control principles in an attempt to seek the general and fundamental principles of both animate and inanimate systems. Rosenblueth, Wiener and Bigelow (1943) argued that a simple goal of a system could be termed as goal directed behaviour and purposivenes of action, and that the adaptive behaviour of any system

could be realised in feedback mechanisms. The papers that were written at this time were not without their critics, for Rosenblueth, Wiener and Bigelow used mentalist concepts such as 'intention' to speak about adaptive man made systems, suggesting that some machines are intrinsically purposeful, using a torpedo with a target-seeking mechanism as an example. Therefore, the early interest in control theory and servo-mechanisms allowed the early cyberneticists to use general engineering concepts to study the fundamental structure of different kinds of systems. They suggested that systems which have purposeful active behaviour can be sub-divided into two distinct classes, systems which utilise feedback (teleological systems) and systems without feedback mechanisms (non-teleological). This suggested that only systems which could utilise feedback control mechanisms, whether man made or not, could exhibit adaptive and intelligent behaviour and purposiveness of action.

Although cybernetics suggested that the fundamental need for an adaptive system was feedback, they also suggested that for the feedback to constitute a control mechanism it had to focus on the feedback of information rather than energy (energy historically being a centre of interest to the natural sciences). They therefore suggested that the feedback of information was necessary for a system to guide and adapt its behaviour, as well as allowing such systems some form of predictive behaviour. They suggested that the discontinuity of observable behaviour, in comparing humans and high mammals, is mainly due to the fact that animals are limited to instinctive predictive behaviour, whereas mankind is capable of both instinctive and intellectual predictive behaviour.

The Rosenblueth, Wiener and Bigelow paper offered a further dimension which laid down the foundations for AI; namely that it was possible to make comparisons beween living organisms and machines. They suggested that there were broad classes of behaviour which were the same in machines and living organisms. This emphasis suggested that one could view high order similarities between living organisms and machines rather than seek what was different. This high order similarity was to view both man and adaptive machine as symbol manipulating (information processing) systems, which gave rise to a move in psychology with some psychologists (for example Craik, 1943) tending to develop a model of man as an 'information processor'.

Cybernetics had a profound influence on many disciplines throughout the 1940s and 1950s; perhaps because if started as a truly inter-disciplinary group of people from such diverse areas as Psychology, Engineering, Mathematics, Philosophy, and Physics. Indeed it developed out of the thoughts of theoreticians and scientists who shared similar basic beliefs, but who offered each other different views and experiences.

THE TURING MACHINE.

The development of models which saw the human as an information processing mechanism had foundations in the early work of the brilliant British mathematician, Alan Turing. Turing's (1936) early hypothetical work on finite and infinite state machines suggested that it was possible for a simple symbol manipulating machine to use a tape to read data, store symbols and output its computation. This hypothetical machine 'The Turing Machine' was limited to three activities.

1. Read the symbol that is stored in the tape position that is currently being scanned.

2. Write over the symbol, which is being scanned, with another symbol.

3. Move the tape one position to the left or to the right.

It is important to note that the tape is potentially infinite for extra tape can be added if need be.

The Turing machine is a theory of computability with the machine being determined by a finite set of instructions. Each instruction therefore specifies the present state of the machine, the symbol to be scanned on the tape, the action to be carried out and the next state of the machine.

It was concluded that a Turing machine could in effect become a 'Universal Turing Machine' by reading data from the tape, and imitating the machine's function which is represented by that data. Johnson-Laird (1983) suggests that "A digital Computer and

its program stand in much the same theoretical relation to one another as do a Universal Turing Machine and a tape representing a specific Turing machine." Therefore Turing offered a thesis which showed that it was practical to suggest the possibility that a universal machine could be designed which could change its function based upon information which it read from the tape.

One must recognise that this early work perhaps led to the initial design of the modern digital computer. It is also interesting to note that Turing was one of the first people to actually consider the developments of computer programs as constituting the development of machine intelligence. Indeed, his paper (1963) outlines the foundations for the famous test 'The Turing Test' which he devised to test whether a machine truly exhibits intelligence.

During this period von Neuman designed an architecture for a computing system. Although this architecture was initially built with valve technology, it is still the architecture which is used by modern computers; although the Japanese fifth generation computer project is attempting to move away from this architecture towards parallel processing machines.

To summarise, this entire area encompassed a complex series of events. The emphasis on people as information processors was not without its critics for it offered an environment in which mentalist concepts could be used to refer to machines. The development of this mentalistic language, although offering a constructive and powerful tool for describing the behaviour of machines, opposed the basic tenet of the behaviourist tradition that dominated psychology.

Behaviourism had attempted to break from the non-scientific, philosophical traditions that psychology had grown from; suggesting that there are no mental worlds, and offering a mechanistic approach to psychology. This approach was dominated by the need to be 'scientific' and 'objective', and suggested that all human characteristics could be explained in laboratory conditions; although a great deal of this early research was done by observing the behaviour of lower animals.

Traditionally all psychological use of a mentalist language had developed from 'idealistic' philosophy, but it is ironic how cybernetics had re-presented these early notions on the basis of 'mechanistic' and engineering terms. It was this period which could perhaps be considered as the birth period for cognitive science.

It is also interesting that in Britain the growth of cognitive psychology, which eventually broke the hold of the behaviourist tradition, had progressed alongside the developments of computer technology which came to offer, for the first time, a general-purpose tool for cognitive research. Theories of the cognitive processes began to develop too fast to be built into ordinary mechanisms, but gradually the flexibility of computer programs offered the basis for far more flexible experiments to take place.

THE EMERGENCE OF AI.

Artificial intelligence emerged from this battleground of the early 1950s when the first general purpose computers became available. Newell, Shaw and Simon (1956) began a number of serious programs to experiment with problem solving. This move was the first breakaway from cybernetics which had attempted to theoretically formulate basic principles of learning and behaviour. Consequently, as Minsky (1968) suggests, cybernetics divided into three main avenues:

1) The continuation of the cybernetic search for fundamental principles for self organising systems. This approach can be seen in the work of Ashby (1956) and Pask (1976).

2) The second avenue was an attempt to build working models of human behaviour. This work attempted to replicate the human as accurately as possible.

3) The third approach was Artificial Intelligence which attempted to build machines which are intelligent in their own right.

It is this third avenue which is the main realm of current AI research, although the second avenue which is often termed 'hard' AI still has its support.

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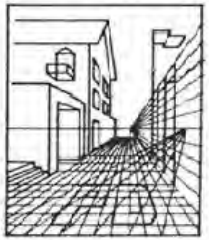

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THE DEVELOPMENT OF AI.

The nature of the learning process has been of fundamental interest to the workers in both cybernetics and AI. Wiener (1948) spoke for cybernetics suggesting that all self adaptive systems must have the ability to learn. The following statement has been a fundamental focus of cybernetics:

"Can man-made machines learn and can they re-produce themselves?" (Wiener 1948 p.170).

Also AI has taken this tradition with the emphasis of many AI programs being on the need for the program to develop better reasoning strategies on the basis of experience as well as increasing its base of knowledge.

McCarthy, in 1956, realised the potential power of computers and with a number of colleagues he organised the first AI conference at Dartmouth College in New Hamshire, USA. Just before this conference Newell, Simon and Shaw had been working on a program which modelled human problem solving called "The Logical Theorist" which had been designed to discover proofs from theorems in logic. Although this early AI program did not find any theorems that had not already been logically proved, it did find some elegant proofs of existing theorems.

So, although computers had been mainly designed to aid researchers in disciplines which had inherent mathematical problems, such as Physics, it began to be used for non-numerical computations. McCarthy developed a language called LISP which allowed symbols to be manipulated in the form of lists. One of the major strengths that this language has over other formal languages such as Fortran, is that there are no differentiations made between program code and data. Consequently, programs which are developed in this language can analyse their own functions and re-write them if required; this facility has obvious and fundamental importance for the design of programs which need to adapt and learn. With this development, a number of programs were written to manipulate symbols in the form of problem-solving and pattern recognition, as well as modelling simple learning tasks.

Artificial intelligence therefore developed out of two distinct groups, namely, mathematicians and computer scientists on the one hand and on the other researchers from such fields as cybernetics, neurology, biology and psychology whose main area of enquiry was the investigation of the structure of biological systems.

The early work in AI attempted to look for general mechanisms of learning by developing systems which could adapt to their environment without any prior knowledge. Unfortunately most of the attempts failed with the attempts that succeeded being seen as trivial. This period also emphasised the early AI researcher's beliefs that general mechanisms could be developed. It was during this early period that Newell and Simon (1963) developed their 'General Problem Solver' (GPS).

Throughout the 1960s, the attention of AI researchers moved away from learning towards knowledge based problem solving and natural language understanding. Samuel (1963) developed a checker playing program which developed a better game on the basis of experience. But it was mainly Winston's research (1970) which renewed the AI community's interest in learning mechanisms. This new trend has tended to accept the fact that the learning process is a complex and difficult process. Consequently, AI research has moved away from attempting to discover general principles of learning and problem solving towards a more specific approach. This more recent approach concentrates upon simple learning problems on the one hand, and on the other, the development of large knowledge bases of domain specific knowledge.

There was therefore a move away from attempting to discover general models to the more modern approach in developing systems which are intelligent in a small domain. This major progression of AI has culminated in the current research on expert systems. Of course, the area of expert systems can be seen as the main area of success that AI has achieved to date. But, although the outcome of AI research, on the surface, appears to have achieved few practical outcomes in the form of products, it has achieved a great deal in developing tools which will aid future reseach in this area. Tools such as LISP, PROLOG, POPLOG, and POP-2 offer cognitive research powerful programming environments and the AI techniques which are associated with knowledge representation and elicitation offer powerful methodologies for future work in the modelling of the cognitive processes.

It is perhaps this background that has tended to influence governmental attitudes towards AI research in Britain. The entire nature of this research area is fundamentally difficult because of its expensive, long term nature and the fact that it is true pioneering research which is still in its infancy and therefore cannot offer final guarantees.

THE POLITICAL BACKGROUND OF AI RESEARCH IN GREAT BRITAIN.

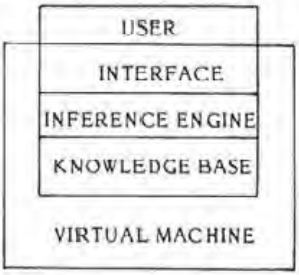
The field of artifical intelligence, in Britain, has suffered a great deal from governmental policies. The recent recommendations of the Alvey Committee (1982) for the British government to encourage work in AI research has created a new focus. These recommendations have been made in an attempt to stop Britain from falling behind the recent innovative spirit of the Japanese fifth generation computer project. This new attitude is a major political change in Britain for, historically, the Science Research Council commissioned Sir James Lighthill (1972) to produce a report on the developments in AI: The Lighthill report was highly critical of AI research in Britain and consequently the repercussions of this report were that a number of valuable and active British AI research groups were cut. This led to a number of eminent AI researchers leaving Britain to set up AI research units in countries which offered them the appropriate support; such as the USA.

The Japanese fifth generation computer project has had a major effect upon attitudes towards the development of intelligent machine research. The Japanese proposals were preceded by an exhaustive survey of international academic research in AI; the major emphasis being found in the USA. But interestingly, the language that they decided to use was primarily European based. This language is PROLOG, which is based on symbolic logic and was first designed to formalise natural language and human reasoning (Clark and Tarnlund 1982).

The aim of the Japanese project is to create knowledge based systems which are intelligent, in an attempt to achieve man-machine interfaces that are natural to man. The general aim is to pull together both software and hardware projects in an attempt to implement inference generation, learning, and pattern recognition (both visual and aural). Also to develop software which is intelligent enough to write its own programs with an intelligent interface which could elicit the requirements of the software from a human.

The British government commissioned the Alvey Committee in 1982 to write a report in response to the Japanese initiative. The Alvey report (Alvey, 1982) made a positive response emphasising the need for a nationwide collaborative research and development (R&D) initiative into the study of intelligent knowledge based systems (IKBS). They suggested that such systems should be capable of handling large, incomplete, uncertain or rapidly changing stores of knowledge and have heuristic inference procedures to flexibly access, maintain and generally exploit the stored knowledge. Also the recommendation suggested that such systems should have intelligent front-end interfaces which can communicate with the user of the system in some form of natural language.

Sparck Jones (1982 p.6) offers a structure for an IKBS as



A further consequence of this report was that the British government have now realised the implications that Information Technology (IT) holds for education. Consequently the Social Science Research Council commissioned Sage and Smith (1983) to look at the area of IT in education. The Alvey committee had identified four 'enabling technologies':

1) very large scale integration (VLSI)
2) software engineering
3) man-machine interface (MMI)
4) intelligent knowledge based systems (IKBS)

and Sage and Smith (1983) suggested that

items 3 and 4 were particularly relevant to the area of micro-computers in education. They suggested further that although the Alvey Committee had directed their attention towards

"the significance of understanding...(the) ...cognitive processes and the organisation of knowledge for the design of expert systems...." (Sage and Smith, 1983 p.11)

it had paid little attention to the need for applying this area of intelligent systems to its use in an educational context. The recommendations of the Sage and Smith report also suggested the need for a collaborative R&D initiative which should meet two particular areas of need

"... an information base for the planning of curricula and - a research base for what might be called an 'education industry'" (Sage & Smith, 1983, p.15).

Without going into too much detail, Sage and Smith recommended that many areas of AI research were relevant to education and cite Cooper (1980)

"Perhaps the real challenge now is to combine the collective expertise of the computer scientists, the cognitive psychologist and the subject matter expert to develop true models of knowledge bases and acquisitive skills for different topics. Our systems need to become 'intelligent', flexible and capable of learning themselves in order to be truly valuable to the student".

To summarise, there has been a massive change in the attitude of the British government from cutting research activities which were long term and which attempted to find answers to difficult areas such as the nature of

1) natural language understanding & processing
2) knowledge and how it can be represented
3) the learning process in general
4) perception and pattern recognition
5) automatic programming

to actually supporting such research.

CONCLUSIONS.

To conclude, the relatively short history of AI has seen many changes both in its approach to its area of enquiry and in attitudes towards it as a research initiative. It has been shown that the field of AI can be generalised as an inter-disciplinary research community that is interested in using computer technology to model tasks that if carried out by a human being would be considered as intelligent activities. Therefore the basis of such research is pragmatic in as much as it uses computer programs as working hypotheses, but such research is generally long term, and due to the complex nature of this field of enquiry, cannot guarantee success. Artificial intelligence can therefore be generally summarised as attempting to model and understand the areas in which philosophers have been intellectually debating for centuries; namely the nature of the cognitive processes.

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Apple //c

Apple //c - A First Impression.

With the announcement on 24th April of the new //c, Apple seem to have done it again. Not only have they managed to compress a //e down to a size of 30cm long by 29cm wide and 6cm high but they have also squeezed into this space the equivalent of 2 serial cards, an 80 column card, 128K of user memory (RAM) and a 5.25 inch (143K capacity) disk drive.

The //c is a portable machine - weighing only 7.5 lbs it has a built in handle that also doubles as a tilting mechanism which gives a more comfortable typing angle. Apple say that the machine was designed primarily as a business computer to compliment their //e systems, the majority of which, in the UK at least, are to be found in offices and frequently connected to hard disks and networks which would make it difficult to move the equipment around.

Besides the drastic reduction in size the outstanding difference between the //c and its predecessors is that there are no slots at the back of the machine for plug in boards. This will not (in most cases) worry any potential buyer as it already contains more built in "add-ons" than most users ever aspire to.

The back of the machine contains the 6 output ports, power supply input connection and an improved on/off switch. As is now standard with Apple products, the ports now have icons (pictures) of their functions rather than the printed word against them.

Two of the inputs are a small 9 pin socket for the Apple mouse, joystick or hand controllers and a 15 pin socket to be used for a television or an RGB monitor. This output can also be used for an 80 column by 24 line, flat screen liquid crystal display which is expected to be available around September at an estimated cost of £500 - £600.

A video monitor output and an external disk drive socket are also included as standard as are 2 serial ports, one for a modem to enable communications between computers and the other for a printer or a plotter. As you may have noticed with the Macintosh, the company no longer uses parallel interfaces for printers etc. on any of their new products.

The processor is a CMOS version of the 6502 called the 65C02. While it is an improvement on the original chip, software that ran under the 6502 will still run without any problem. There are some programs however that will not run on the //c and generally these are the ones that are dependent on a piece of add-on hardware within the machine. Music and sound boards are a case in point and CP/M programs which rely on a plug-in Z80 processor PCB is another.

Other features of the //c included as standard are 128K RAM (user memory), 16 colour graphics, double high resolution (560 x 192 pixels), a modulator and a built-in speaker with headphone jack and volume control. The full sized, 63 key keyboard is almost the same as found on the //e and felt very comfortable to use. Above the keyboard are the reset button, a 40/80 column switch and a UK/USA character option switch. To the right of these are 2 lights, one for power on indication and the other shows if the built-in drive is being accessed. Apple say that to use the 80 column option a monitor should be used rather than a television.

Add-ons available include a purpose built, 9 inch green screen monitor, the now famous mouse with the mouse paint program, an external disk drive, a serial printer (Imagewriter) and a carrying case.

The equivalent price of a //e with all the add on boards required to bring it near to the same specification as the new //c is approximately £1481 whereas the new machine costs £1063.75 (VAT included). Why then would anyone still want to purchase the //e? Part of the answer of course lies in the second paragraph of this article. If you use an Apple for business applications the chances are that you will require a hard disk or will want to run CP/M. While this is quite possible on the //e and its predecessors (with add-on capability), the //c has not been designed with this area in mind. In other words it is not as expandable. At the other extreme, integer is no longer catered for and neither are cassette tape based programs. Many people within the scientific community also use Apples as controllers for experiments using A to D and D to A boards and the like. This sort of work cannot be done with the //c. In other words you pay your money and you take your choice - expandability or portability, bearing in mind that what is offered as standard on the //c is, in many cases, more than adequate for the average user.

Competition

A prize is on its way to the winner, Dave Miller of Finchley, London N3, who sent the following answer:

"The reason why the program gives the unusual result the first time is that the start of string space pointer is pointing to location $BFFF. Thus the first string read in is placed at the very top of memory. All subsequent strings 'pile down' from this location. For some reason VAL doesn't function properly when the string to be evaluated is at the very end of user RAM. The reason why this does not occur with DOS is that HIMEM is moved down so the first string is not placed at the end of user RAM. This can be illustrated by the following program (don't use DOS):

```
10 GET A$
20 PRINT VAL(A$)
30 CLEAR
40 GOTO 10
```

The program will now always give the odd result because CLEAR removes all old strings thus each new value of A$ will start from the top of user RAM. The following program will prevent this problem occurring:

```
10 GET A$
20 A$ = A$ + ""
30 PRINT VAL(A$)
40 GOTO 10
```

By adding nothing to A$ its contents are effectively moved down from the top of memory since the new value of A$ (to the right of the equals) is regarded by Applesoft as different to A$'s old value (to the left of the equals) and so piles down from the top of memory in the same way all other new strings pile down (it's slightly confusing).

The fault seems to lie in the VAL function although I cannot say for sure what it is."

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Format 80 : Enhanced

A Word Processor Review
by Chester Kemp

To review a word processor is not as straightforward as it at first seems, because ultimately the value to the user is a subjective thing: therefore what I have tried to do is to evaluate its capabilities by its own design standards, by the needs of a typical user, and also by my own subjective impressions. I have previously used a number of word processors on the Apple (such as Magic Window, Screenwriter II, Applewriter 1.0 with Go Between for the Centronics 739, and Applewriter II), and further to this I use Wordstar on a variety of business micros in my professional life. My own writings consist of letters and articles at home, and lengthy reports and programs/command files professionally.

"Format-80 : Enhanced" is a professional 80-column word processor package running on a 64k Apple //e or an Apple II+ with a 16k RAM card. It currently runs under DOS 3.3 (but a ProDOS version is expected to be out for the Slough "jamboree"). On the Apple //e, there are no installation problems, you just boot the disk and you are up and running, but if you have a II+ then you insert a supplied keyboard modification into the games socket to allow a shift-key facility. I ran the system with a Euro-plus Apple, U-microcomputers 16k RAM card, a Videx Videoterm with soft switch, and a Centronics 739 printer. Most 80-column cards are supported, and the boot program automatically identifies the appropriate board. (The Videx Videoterm does not support an inverse character set as standard, and an inverse chip can be cheaply provided by Elite Software as an optional extra).

Entering text is simplicity itself, and the immediate error correction can be a plain destructive back-space with re-typing. Shift lock operation is standard on the //e but is equally easy on the II+ with shift-control setting it, and the shift key clearing it; thus it handles exactly like a physical typewriter. Tab stops are easily set and cleared, and movement to these stops are either by the Tab key (//e) or ctrl-I (II+). Margins, both left and right, are easily set and moved. It is quite possible to create a document with two columns of text on screen, and have them properly presented without printing and pasting. One of the prominent features of this package is the strong visual image on the screen, with information of the document name, page, line, column and type of action in progress; also you can see whether you are in upper-case, and where tab stops and margins are. Adding to the visual approach, this is a "what you see is what you get" processor, so that you know exactly what the printed page will look like whilst you are typing it. The authors (Mike Hardwick and Gordon Beckmann) have created an office typewriter environment, including the idea of working on sheets of paper. Each sheet of paper is a DOS filename (including page number), yet there are facilities to handle all these sheets as a complete document. This approach means a shorter learning curve for typists (even if new to computers), and so an asset to the small businessman.

The Escape key toggles between two modes of action ("Format" and "Enter" text), and these can be freely toggled at any time. As a visual aid, they use a different cursor for each of these modes. "Format text" has a number of powerful single-key commands (memorably named using the initial letter of the function) which allow insertion, editing and manipulation of text: fill-justification (even right margins), the complementary compression of extra spaces, as well as centring text and aligning columns of numbers. The usual find, as well as find/replace functions are there, and these work either for the page, or for the full multi-paged document. Cursor control is straightforward and allows you to move to the start and end of text, plus the customary up, down, left, and right. The processor recognises units of character, word, line, sentence and paragraph; these are used to move forward or backward, as well as to delete or space-fill areas. Blocks of text can be moved about a document by copying or deleting it into a buffer, and then subsequently inserting elsewhere. One feature I liked was a word count facility which allowed me to keep a track of my writing when having to provide articles by the word length (although, as it starts its count from the next whole word after the cursor, a document commenced at the very first character will be one short of the actual count).

An impressive feature of Format-80 is the

FORMAT-80

FOR THE APPLE][AND //e

Format-80 is simple to use. Text entry is as easy as using a typewriter. Editing and formatting is achieved with single key strokes. "D" for delete, "I" for insert, "J" for justify, "C" for centre, etc. Easy to remember commands because they make sense.

What you see is what you get. Format-80 performs virtually any editing and formatting function you can imagine, and displays on the screen the text exactly as it will print out.

It supports all Apple compatible printers.

Format-80 also includes a sophisticated mailing list, which comes complete with full sort and selection capabilities.

The program resides entirely in memory, including the mailing list. All drives are free for text and mailing list data.

It comes complete with a tutorial manual and a concise, easy to use reference manual, plus a handy user reference card, and is supplied on a standard DOS disc. The disc is not copy-protected.

System requirements:
64K APPLE][//e, and most Apple compatible machines.
Disc Drive.
80 Column Card. (supports most 80 column cards)

Also available as an upgrade to existing users of Format-80, including revisions to the reference manual, details of new features, and upgraded software.

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sophisticated print control, in particular for daisy wheel printers; alas, I only use a dot-matrix printer with Apples so I can only report on this aspect. There are capabilities of using full proportional type and spacing (stating the aggressiveness of the justification), and also where the daisy wheel does not have a standard sequence of characters, you can set up the print installation so that it will correct for the hardware's shortcomings. Default settings are available for some printers to underline and embolden text, but I would like the variety increased to handle dot-matrix ones. Nevertheless, I was able to make much practical use of the print installation area, for Format-80 allows you ten special sequences (ctrl-0 to ctrl-9) which can be set to underline, double width, reverse line-feed, and half line feeds for super- and sub-scripts, as well as a variety of fonts. To print documents, you specify the number of copies required of either the page in memory, or a combination of page ranges and/or file names.

The small business has a need for a mail-merge facility: this enables them to send out a standard letter apparently personalised by adding, for example, name and address. Format-80 has a simple database to handle this problem and allows up to 510 records of 256 characters each. Given the relevant information, you could make a selection from the database, so that your mail-shot could be to all people in Manchester who are not accountants. This was actually their own example (in a properly conceived database), but it does suffice to demonstrate the logic and power of the search capabilities for a small business. A non-standard formatted disk holds a single database. The editing facilities for this list are basic, but in practical use this ought not to be of any real significance.

Format-80 comes complete with an excellent manual in an A5 ring-binder, plus a handy reference card. The manual commences with a short 17-page tutorial broadly covering most points, and together with an eight minute automatic on-screen demonstration program, I think it conceivable that this could almost be enough for anyone to lose their fear of computers and actually use the word processor! Next comes the reference manual: this is very clearly written and presented, giving useful examples of each command in action - one just cannot say better than that.

Lengthy information is given on print installation, and this is just as well, because I had to read it a few times to get to grips with some of the points; though the instructions are accurately given, I do wonder whether they could be expressed more clearly. On one point they are in error by omission: the header and footer installations require the "Start Pagination" option to be No-Skip if they wish a heading to be printed on the first page, even when no page numbering is required. The print installation also allows you extra chores, so that you can create a document of 3 pages of 80 lines, and then print it as 8 pages of 30 lines, with primary and secondary headings and footers inserted as needed.

A document can be re-vamped to change length of pages by the Quickscan facility, which can be useful for irregular but frequent changes of page length. Text is stored as a number of lines, each completed by a carriage return, and a file can be up to 80 lines of 80 characters. Paragraphs are intelligently recognised so that if you have the odd formula written on a separate line in the middle of the page, it will realise that it is still part of the same paragraph. Occasionally, this is a nuisance: if you indent the start your paragraph by more than six spaces, it will not recognise the change. Another quirk is that the user-defined ctrl-0 is stored as ASCII 00 and translated by Format-80 at print time; however, this is a problem to spelling checkers, for the 00 tells it the file has ended! Advice: use it sparingly. The booting program takes about a minute, and this can be speeded up to a quarter of minute using Diversi-DOS or Elite's beautifully designed Wildcard Plus; this speed increase is only on the boot though, for the program handles text read/writes efficiently and speedily.

The program is NOT copy protected therefore you are immediately advised to make back-ups. The complete program, including the database section, is all resident in RAM, so that if you only have one disk drive, you will get full use of a data disk. It will support two floppy disk drives, as well as most hard drives. It correctly recommends a video monitor rather than a TV screen. The //e's keyboard and design is fully used, but the II+ has a hidden snag in the keyboard modification: if it is installed and co-resides with games paddles with a two-way adaptor (such as EZ-Port), then your arcade

games will not function properly if they use the triggers. By the by, this is not the same as Format II (commonly sold in the USA), although I believe its roots are in the earlier and un-enhanced Format-80.

I have previously been stuck between Go-Between's ability to handle the Centronics 737/739 proportional font and the powerful flexibility of Wordstar. I still prefer that proportional font, but miss the on-screen visual control in Go-Between. Wordstar has the edge over Format-80 in general, but it has some negative points when running on an Apple: you lose space on disk because the program needs to be co-resident (because it overlays into RAM as it needs it), you are constantly thrashing the disk drive, and it also costs considerably more (especially if you also have to buy the Z80 board and CP/M). Wordstar will not run on the new //c but Format-80 will. For me, Format-80 is an excellent product by any standard (any quibbles being quite minor), and thus it displaces the alternatives. I would strongly recommend this to anyone, but in particular to small businesses, and to anyone not yet committed to the eccentricities of a particular word processing package.

The program is written, supplied and well supported by Elite Software Co. (30 Guildford St, Chertsey, Surrey KT16 9PQ), although it is available from most dealers. It currently sells at £129.00 (+ VAT = £148.35), and an upgrade from old Format-80 to take advantage of its new features and standard DOS, is £25.00 (+ VAT = £28.75). My thanks are due to Elite Software for providing a copy of Format-80 for this review, and Mark Whelan for answering my many questions, as well as the tolerance and helpfulness of the authors.

Software Library

Many thanks to all those who have offered to help in the Software Group. You will soon be getting something to work on. Any further offers will be welcomed. Just ring the Software Librarian or drop a line to him via the PO Box.

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See p. 40. for more.

More on the ITT 2020

by Andy Holderness

Following on from Mike Siggins' article on the ITT in the February Hardcore, I thought a few more points, based mainly on bitter experience might be worth while.

1) CP/M.

As mentioned in the article, the Softcard can be altered to work on the ITT, but at a cost. Peanut Computers are currently selling a Z80 card for the Apple II at £44.50, but ask some £25 more for an ITT version.

The following fix works on the Softcard and the Digitek Z80 card (as usual with all fixes based on taking a soldering iron to your machine - it's all strictly at your own risk). All I can say is that it worked fine on the card that I use.

Locate the 74LS107 IC at the top of the second column of ICs from the left (card facing you with the edge connector to the bottom). Remove this IC from its holder, and carefully bend up pin 12. Solder a length of wire to this raised pin, sufficiently long to reach over the card to the back of the edge connector.

Replace the IC in its holder (pin 12 no longer enters the socket, of course), then bring the free end of the wire over the card and VERY CAREFULLY solder it to pin 37 on the edge connector (extreme care is needed here, as there is no proper connection to this point on the edge connector).

The card can then be placed in any vacant slot, and CP/M booted. In the case of the Digitek card fitted to my own machine, a number of small capacitors had to be disconnected before all was completely well - if you are modifying one of these cards, they are the ones that don't look as though they should have been there in the first place!

Some of the cheaper cards do not have a full set of connections on the edge connector on the card. In this case, it will be necessary to find an appropriate point at which to tap the 8.8Mhz signal on the main board (soldering on the back of the board where the expansion sockets are fitted would seem to be the easiest place).

Following on directly from the above fix for the Z80 card, I have not, so far, found any CP/M software that will not run on the ITT, with, of course, the exception of the HGR statements in the Apple version of Mbasic. These, like those in Applesoft, need either the Jailbreak fitted, or the hard-wired graphics fix. Having said that, however, I have never actually used the Mbasic hires routines.

2) Applesoft/Palsoft.

To use Applesoft basic, I have replaced not only the D0 and F0 roms, but the E0 also. I do not know the precise difference between Applesoft and Palsoft at this point, but note that the Apple master diagnostics disk refuses to run with the Palsoft E0 in place on the motherboard.

3) UCSD Pascal/Fortran.

In order to use the full resolution of the ITT screen under Pascal, you will need to buy a copy of disk P1 from the club library. This is a version of APPLE1 issued by ITT with revised Turtlegraphics routines in it to address the 9-bit graphics. Unfortunately this disk cannot be used directly with the current release of Apple Pascal (1.1). In order to use the routines, use the LIBRARY program on APPLE3 to transfer the Turtlegraphics units from SYSTEM.LIBRARY on PAL1 (the ITT disk from the library) into a temporary file, then use these units to replace those in the SYSTEM.LIBRARY on APPLE1 (copy disks only, of course). The numbers of the intrinsic units are the same, so object code compiled with the Apple Turtlegraphics will run ok, albeit only addressing part of the screen.

These routines can also be incorporated into the SYSTEM.LIBRARY file on FORT1 in the Apple Fortran system. (In this case, of course, FORTLIB.CODE is used to make the transfer.

The fix for upper/lower case entry in my letter in the October 83 Hardcore, by the way, also allows the ITT to produce left and right square brackets as per the Pascal manuals.

4) Aztec C.

A similar fix is also needed to make Aztec C, from Manx Software, run on the 2020. In this case, however, the patches have to be applied direct to the disk, as although source code for the various device drivers is supplied, the Unix-like operating system that the C shell sets up requires all commands to be entered in lower case. As the shift toggle is once more at $C063, it is entirely pot-luck whether you have lower case or not when the system is booted, or you will retain it long enough to make the system accept the changes. The patches are as follows (on a COPY of Disk 1 - startup):

Patch the following to $60 from $63

Track	$13,	Sector	$0B,	Byte	$2E
	$18		$0E		$AA
	$19		$0E		$AA
	$1B		$0E		$AA

Once these changes have been made, the disk can be booted (once DOS has been added), and the device drivers can be rewritten as you choose.....

5) Transforth and Graforth.

Two other languages tested - both from Insoft - are Transforth and Graforth. Surprisingly, Graforth ran (with the usual 9th bit provisos), but Transforth would not. It appears that the latter relies heavily on the graphics routines built into Applesoft and hence requires it to be present.

6) Others - misc.

I have just attempted to test Softerm II on my ITT, only to find that it cannot be run - this is one of those systems which requires a hardware adaptor in order to run; in this case a keyboard extender, which appears to conflict with the internal architecture of the 2020. I say appears, as the code in question is in an EPROM, and I have no means of analysing it, and there is no source code information provided in the package.

Surprisingly the Mountain Computer CPS card is completely compatible with the ITT. This was fitted to the machine exactly as per instructions, and has run perfectly since. I use this system extensively for communications, and find this card, in conjunction with the Ascii Express Pro. software, reviewed recently, to be almost ideal.

7) Here We Go Again Dept.

I have just bought a copy of the new version of GPLE (with the Pro-Dos files on it), only to find that the ctrl-a shift wouldn't work. Usual problem; the toggle was at $C063. Disk patches are:

Track	$13	Sector	$0C	Byte	$2C
	$21		$05		$FF
	$22		$04		$26

Each of these locations should be altered from $63 to $60.

Limited experimentation with the Pro-Dos files on the disk seem to indicate that the shift toggle works fine here, but there seems to be some sort of problem with the ctrl-v video toggle. Investigations proceeding.....

In conclusion, I would like to ask the following of any ITT owners:-

a) Have any of you implemented a lower-case mod?

b) Does the Videx Softswitch work?

c) If you find incompatible software/ hardware, write to Hardcore about it, so we will all know what works and what will not!

Lonely Apples

The following member would like to contact other Apple users:

Mr. G. W. Ferguson
[illegible]

*****

Chris would like to get in touch with people who use Mountain Hardware's ROMPLUS+ card. He can be reached on [illegible] daily until 8.30 pm.

Sercom Serial Card

A review by Ewen Wannop.

First we had the Apple computer, then we had the peripheral cards. Without those eight slots tucked away inside our machines, where would the Apple be now? And what would we have been able to do with it? It was a far reaching decision indeed to incorporate them into the original design.

Most of us have at least the disk card in Slot 6, and possibly a printer card in Slot 1. We might have an extension Ram card in Slot 0, but how many have a put a serial card in Slot 2?

Communication between machines has grown in the last year to a point where we can all benefit from the ability to talk to another computer. The printer card enables one-way communication with a printer or other machine placed up to a few feet away, but a serial card opens up a whole new world. It can talk and listen to any make of computer that can support RS232 or RS432 serial protocols, and that means nearly every computer there is! It talks over a line that may be 20 feet or more, that at its least need only be three wires and, by means of a Modem, can talk over two wires to the whole world (though the phone bills will be equally impressive). There is a growth of communication using modems amongst the personal computer world, both for business use, data transfer, Prestel, Micronet and the bread-board message boards. Basug's own excellent board run by Quentin Reidford in Sheffield is now used by many Apples round the world. All of these techniques require in addition to the modem, a serial card in the Apple that can talk the language of Baud rates, Bit lengths and Parity. If you wish to access Prestel and Micronet then you really need a card that will support split baud rates, in order to be able to receive at 1200 baud and send at 75 baud on the back channel.

There are very few serial cards that will support split baud rates, but now we have, all the way from New Zealand, a card that not only does that but has a built in dumb terminal program, allowing half and full duplex transmission, and the ability to be set to either Terminal or Modem settings on its RS232 cable. The now common Apple Super Serial card will do all of this except for the split baud rates, but at a price that is nearly half as much again!

The Card.

The Sercom II serial card from Computer Shop Ltd. comes in a padded box well protected from the rigours of the Post Office and is constructed to the high degree we now expect from most Apple peripherals. The board itself has a total of 12 logic chips plus a 6850 serial chip and a 2716 EPROM holding driving routines. There is a transistor which switches the current to the input buffer from the Apple bus, so we should be assured of no complications from that end from slow chips holding the data bus. On the top of the card, easily accessible while the card is in the Apple, is a six pole DIL switch that controls the baud rates to the transmit and receive functions of the chip. A 26 way IDC plug and ribbon cable are connected to a free RS232 female 'D' plug. Two square 'headers' may be turned to change the sense of the receive/transmit data, and the DTR/RTS line.

What it can do.

The card supports baud rates of 75/150/300/600/1200/2400/4800/9600, and these may be in any combination for transmit and receive. As a standard 6850 serial chip is used, all the usual bit sequences can be set up from software, though the manual does not tell us how. Interrupts are supported by the card, but not as the card is delivered. I found three blank spaces on the card for a transistor and two resistors. When fitted with suitable values I was able to get interrupts from the card, but only after a bit of detective work could I discover the address I had to poke to enable the interrupt output. Why the interrupts had not been wired up in the first place I do not know, and why was there no mention of it in the instructions that came with the card?

The software.

The card closely resembles the CCS serial card as far as software is concerned and all the terminal programs I tried the card out with ran first time when set up as a CCS serial card. These included the two versions of Ascii Express and Visiterm. However,

built into the board is a simple terminal program that can be accessed by issuing control codes. This allows full or half duplex operation, and can be controlled from either the Apple keyboard or from outside the Apple by sending into the board the correct sequence of control characters. However I was disappointed that the instructions only told us that this would support lower case characters in inverse video. An address has to be poked to do this as upper case only is set on entry. The instructions tell us the value to get lower case in inverse video, but did not mention that if you poke this address with $00 you will get lower case normally. After setting the card to 1200/75 baud and enabling the interrupts, I was able to use the card with my own Prestel/Micronet software that uses a serial card rather than the games port that Micronet's own software uses. I like to keep my games paddles in there! The split baud rates are a much more satisfactory way of getting the two baud rates required than flipping constantly between the two whenever you send a character as is necessary with the Super Serial Card.

The instructions and the bad points.

After the good points come the bad ones. I have already mentioned some of them, that I had to put in the components needed to enable the interrupts for instance and that they did not mention how to get true lower case from the terminal mode. The split baud rates are a great plus for this card, but they must be set by means of the DIL switch; this means turning off the machine if you do not want to run the risk of the board slipping in its socket and blowing all your chips. It is not impossible to have had them set up by writing to a unique address, this would have allowed a change in mid stream without the danger of opening your Apple. The ribbon cable from the board is just long enough to extend to the back of the computer. I would have liked it to be longer and stretch to my modem, but this seems to be the length that all the serial cards think is needed. It is quite expensive to buy two 'D' plugs and ribbon cable to extend this any further! While looking at the back of the board, I noticed a large number of jumper points, all labelled, that obviously allow various options to be achieved, but on turning to the pamphlet - I hesitate to call it a manual - the only ones mentioned are those that enable you to replace the 2716 with a pin compatible Ram chip. The instructions are very basic indeed. What they do cover they do fairly well, but the technical information is limited to one side of a page. It mentions nothing about the interrupts or how to achieve them, or any information other than the addresses of the ports that might be of use to a programmer. There are only 15 pages of instructions; they have been properly typeset however but it surely could have been possible to have made a more workmanlike manual than this. I would rather have seen what is now quite common, instructions printed on an ordinary daisywheel and photo-reduced, and had a full set of information than this rather meagre booklet.

To sum up.

An excellent card, giving good value for money, capable of running from all the terminal programs on the market, but let down by its meagre manual, and the need to add components to make it support interrupts. I hope the manufacturers can put these gripes to right, although even so, I recommend this card over the more expensive Super Serial Card for communication use. It will cope with all but the most obscure configurations and uses that the latter card supports, though for all the things that I wanted the card to do, I found none that it would not support.

My thanks go to Data Efficiency Ltd. for lending me the card for review.

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Applewriter I Strikes Back

by E.R.Mather

There must be a lot of folks like me who have never managed to afford Applewriter II and have struggled on with I for a good number of years until it has become a matter of principle never to change!

Applewriter I has three big disadvantages for my use.
1. You can't do multiple copies.
2. It's very tedious going to and fro from Editor to Printer to correct yet another spelling mistake.
3. You can't send control characters to the printer to change its print type (I use an Epson MX-80).
Apart from these factors AW I is quite adequate for my needs.

Criticisms 1 and 2 have been solved for quite some time; there have been articles in Hardcore about multiple copies (February 1983), and since I bought Diversi-Dos and a 16K RAM card I have been able to use Ian Trackman's Switcher routine (April 1982). Dare I say that Ian's program gave me lots of headaches, as I'm not too good with machine code, until I discovered that he'd got high bytes and low bytes interchanged.

Problem 3 was solved by reading an article in the Spring 'Orchard Computing'. Messrs Walter Wilson and Nicholas Brown have written a patch to the printer program which allows you to send control characters directly to the printer, thus changing the print mode.

The crucial character is ^ (esc + shift n) in Applewriter I. Any lower case letter following this is converted to a control character, and any capital to esc + letter. Thus to switch to enlarged printing type ^n, to use emphasized type ^E; the appropriate controlling codes are in the Epson manual. In addition, you can get at some of the odd characters by using ^ followed by a number.

Their program was written to go into locations $1863-$18FA; but if your printer program is already patched to take account of multiple copies, this runs over the $1900 mark where the text files are loaded, the overlap isn't very helpful. So, I relocated their program to begin at $300.

Enlarged printing is automatically killed by the Epson with every carriage return; Wilson and Brown used two special characters with ^ to switch on and off continuous expanded (enlarged) printing - "!" and "" respectively. I managed to alter the program so that ctrl-n and ctrl-t give continuous expanded print anyway.

Step 1 - BLOAD your printer program noting its start address and length, call-151 to enter the monitor then type

12B8:A9 00
12BC:A9 03

this switches the printer output to the routine at $300
- BSAVE the altered printer file.

Step 2 - still in monitor, type in the hex dump, or the assembly listing and assemble and then add

385:00 00 (this reserves 2 bytes for flags)
387:7B 7D 5B 5D 7C 7E 5C (these are the characters for the special symbols in the Epson manual - you can add others if you like, see the manual)

BSAVE PRINT PATCH,A$300,L$8D
(or as long as yours is).

Step 3 - ctrl-C return to get back to basic,load hello and add a line to BLOAD PRINT PATCH.

Note - Wilson and Brown do not annotate their program so I have added my own comments, hoping they are correct and understandable. The original authors give extra information about how to alter the program for other printers and how to translate capitals into esc+ctrl letter if required (the 2 NOP's at 356,357 are for this).

```
]PREO

SOURCE FILE: PRINT PATCH2
----- NEXT OBJECT FILE NAME IS PRINT PATCH2.OBJO
0300:            1          ORG  $300
0385:            2 FLCC     EQU  $385      FLAG FOR A CONTROL CHARACTER
0386:            3 FLEP     EQU  $386      FLAG FOR CONT EXPANDED PRINT
0382:            4 PR1      EQU  $382      ADDRESS FOR PRINTER
0383:            5 PR2      EQU  $383
0387:            6 ST       EQU  $387      TABLE FOR SPECIAL CHARACTERS
0300:48          7          PHA
0301:29 80       8          AND  #$80
0303:85 FF       9          STA  $FF
0305:68         10          PLA
0306:29 7F      11          AND  #$7F
0308:48         12          PHA
0309:A5 5A      13          LDA  $5A
030B:8D 82 03   14          STA  PR1
030E:A5 5B      15          LDA  $5B
0310:8D 83 03   16          STA  PR2
0313:AD 85 03   17          LDA  FLCC      CHECK IF PREVIOUS CHAR WAS ^
0316:D0 0D      18          BNE  COMMAND   YES IT WAS SO BRANCH
0318:68         19          PLA             IT WASN'T SO CONTINUE
0319:C9 5E      20          CMP  #$5E      IS THIS CHARACTER A ^?
031B:F0 02      21          BEQ  INDEX     YES
031D:D0 39      22          BNE  PRINT     NO, SO PRINT IT
031F:A9 01      23 INDEX    LDA  #$01
0321:8D 85 03   24          STA  FLCC      SET CC FLAG TO 1
0324:60         25          RTS             AND EXIT WITHOUT PRINTING
0325:CE 85 03   26 COMMAND  DEC  FLCC      SET CC FLAG TO ZERO
0328:68         27          PLA
0329:C9 60      28          CMP  #$60      IS IT LOWER CASE?
032B:90 1A      29          BCC  CAP       NO, CODE TOO SMALL
032D:C9 7B      30          CMP  #$7B      IS IT LOWER CASE?
032F:B0 27      31          BCS  PRINT     NO, CODE TOO LARGE
0331:C9 6E      32          CMP  #$6E      IS IT A P?
0333:D0 05      33          BNE  TTEST     NO
0335:A2 01      34          LDX  #$01
0337:8E 86 03   35          STX  FLEP      SET EXPANDED PRINT FLAG
033A:C9 74      36 TTEST    CMP  #$74      IS IT A T?
033C:D0 05      37          BNE  NOT.T     NO
033E:A2 00      38          LDX  #$00
0340:8E 86 03   39          STX  FLEP      CANCEL CONT EXP.PRINT
0343:29 1F      40 NOT.T    AND  #$1F      CONV TO A CTRL CHAR
0345:10 11      41          BPL  PRINT     AND PRINT
0347:C9 5B      42 CAP      CMP  #$5B      IS IT A CAPITAL?
0349:B0 22      43          BCS  PRT       NO, CODE TOO LARGE
034B:C9 41      44          CMP  #$41      IS IT A CAPITAL?
034D:90 23      45          BCC  SPECIAL   NO CODE TOO SMALL
034F:48         46          PHA
0350:A9 1B      47          LDA  #$1B      CODE FOR ESC
0352:20 7F 03   48          JSR  POUT
0355:68         49          PLA
0356:EA         50          NOP
0357:EA         51          NOP
0358:48         52 PRINT    PHA
0359:AD 86 03   53          LDA  FLEP
035C:F0 0E      54          BEQ  NOEXP
035E:68         55          PLA
035F:48         56          PHA
```

Peter Trinder hasn't written on new tricks with a DMP this issue. Instead he sent us this. It seems he's been converted! On second thoughts, it is rather a good trick.....

```
0360:C9 0D     57          CMP  #$0D     IS IT A CR?
0362:D0 08     58          BNE  NOEXP
0364:68        59          PLA
0365:20 7F 03  60          JSR  POUT
0368:A9 6E     61          LDA  #$6E     CODE FOR N
036A:D0 D7     62          BNE  NOT.T
036C:68        63 NOEXP    PLA
036D:05 FF     64 PRT      ORA  #$FF
036F:6C 82 03  65          JMP  (PR1)
0372:29 0F     66 SPECIAL  AND  #$0F     ANYTHING GETTING HERE MUST
0374:86 FE     67          STX  $FE      BE SPECIAL
0376:AA        68          TAX
0377:BD 87 03  69          LDA  ST.I
037A:A6 FE     70          LDX  $FE
037C:4C 58 03  71          JMP  PRINT
037F:05 FF     72 POUT     ORA  #$FF
0381:20 02 C1  73          JSR  $C102
0384:60        74          RTS

### SUCCESSFUL ASSEMBLY: NO ERRORS
```

Typing the numbers 0 to 6 after esc shift-N gives the printer codes corresponding to the codes at the end of the patch program.

```
0.(     2.[     4.{     6.
1.)     3.]     5.~
```

```
]BLOADPRINT PATCH2.OBJ0
]CALL-151

*385:00 00 7B 7D 5B 5D 7C 7E 5C

*3800.38D

0300- 48 29 80 85 FF 68 29 7F
0308- 48 A5 5A 8D 82 03 A5 5B
0310- 8D 83 03 C9 AD 85 03 D0 0D
0318- 68 C9 5E F0 02 D0 39 A9
0320- 01 8D 85 03 60 CE 85 03
0328- 68 C9 60 90 1A C9 7B B0
0330- 27 C9 6E D0 05 A2 01 8E
0338- 86 03 C9 74 D0 05 A2 00
0340- 8E 86 03 29 1F 10 11 C9
0348- 5B B0 22 C9 41 90 23 48
0350- A9 1B 20 7F 03 68 EA EA
0358- 48 AD 86 03 F0 0E 68 48
0360- C9 0D D0 08 68 20 7F 03
0368- A9 6E D0 D7 68 05 FF 6C
0370- 82 03 29 0F 86 FE AA BD
0378- 87 03 A6 FE 4C 58 03 05
0380- FF 20 02 C1 60 00 00 7B
0388- 7D 5B 5D 7C 7E 5C
*

]BSAVE PRINT PATCH.A$300,L$8D
```

Here's a sample to show the versatility of Applewriter 1.
First, since the printer stays in the print mode that it was in when last used, let's return it to normal by using
esc shift-N esc F (cancels emphasized mode)..
esc shift-N T (cancels enlarged mode)..
esc shift-N R (cancels condensed mode)..

So now we are back in normal type.

When switching on enlarged print you have to reset the right margin so you don't get a wrap around overlap (I always have a PR£1:ctrl-I80N:PR£0 in my Hello program) so !RM40 sets us up for enlarged.
Now this should be enlarged, egg on my face if it isn't, we can emphasize this as well with a simple (esc shift-N esc E) which gives a heavy effect, let's kill that one with the appropriate code, and now switch to enhanced mode (enlarged plus condensed), since we are already in enlarged mode, giving a (esc shift-N 0) will condense the enlarged and since a line full of this is 65 characters (I think) we can reset the RM
Some of the printer codes operate only from where they are in a line, others change the whole of the line where they are, and I can never remember which is which so often we are a little different from expected.
Switching off the enlargement (esc shift-N T) should leave us in condensed print format and finally with a simple esc shift-N R) we are (hopefully) back to normal.
Although the control characters aren't printed they are taken into account when counting for justification so the fill justify mode may look only left justified in places.

Eamon Update

by Selwyn Ward

Many BASUG members will have already discovered "The Wonderful World of Eamon" courtesy of the BASUG software library. There were around a half dozen Eamon disks in the library, enabling keen adventurers to roam from the Beginners' Cave to the Lair of the Minotaur and beyond.

For those that haven't already ventured into this particular section of the library, Eamon is an ingenious game system designed by Donald Brown and generously donated to the world. Unlike the bulk of conventional computer adventure games, Eamon does not involve hours of frustrating trial-and-error while attempting to best-guess the arbitrary words which the program will accept. The Eamon vocabulary is no broader than any other adventure, but the program makes it clear at the outset which words it will accept. The emphasis in Eamon isn't on puzzle solving. Instead the adventurer spends his time exploring a scenario and hacking, zapping or occasionally befriending any creature he encounters en route. All computer adventures seem to be able to trace their roots back to the fantasy role-playing game "Dungeons and Dragons": but with the honourable exception of Sir-Tech's Wizardry, no computer game gives a closer feel to the original "D&D" than Eamon. Most important, in Eamon, as in "D&D", players select a character to adventure on their behalf and that same character - if he survives - can move through any or all of the different scenario disks.

There's no need to go into the detailed mechanics of the Eamon game system. The Player Manual was printed in full in Hardcore 2 (March 1981), and it is contained in full on the initial Eamon disk (which you must have in order to be able to run any of the subsequent scenarios). What members may not be aware of however is the sheer size of the Eamon range of scenarios. Because the original system was donated to the public domain and the program is perfectly listable many people have written additional Eamon scenarios. This was of course Brown's rationale in freely donating the system.

Although there were only a handful of the

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many scenario disks in the software library, the number has dramatically increased as I have managed to track down to date a total of more than 40 different scenarios, plus several Eamon utility disks. The quality is inevitably variable; but with the possible exception of the apparently anonymously contributed "House of Ill Repute" (a soft porn variant!) there are no really bad scenarios, and there are many excellent ones. The themes of the various scenarios cover ancient mythology to Darth Vader, with some even set in the present day! Some are deadly serious, while others include a touch of humour: "Quest for the Holy Grail" for example is based on the Monty Python film. Several of the scenarios introduce new improvements on the Eamon game system (including a "save" game in progress facility, abbreviated commands etc.), and "Lost Island of Apple" even introduces a non-text mapping element.

If you have any new and original scenarios which you are prepared to make publicly available, get in touch with the software librarian. If you want some of the new scenarios or utilities, order them from BASUG as usual.

Book Review

Title: Build Your Own Expert System
Author: Chris Naylor
Price: £6.95
Paperback, 8x6 inches, 249 pages
Publisher: Sigma Technichal Press

Reviewed by Richard Welch

If you have been intrigued by magazine and newspaper articles about expert systems and wish you could get to grips with the subject then look no further. Chris Naylor has written a book which cuts through the jargon to present the basic ideas in an easily understandable form.

Not only is it packed with common sense and good advice, it also contains listings of BASIC programs for the Apple II and Sinclair Spectrum microcomputers. There is very little machine-specific code (in the Apple listings especially) and it would be a simple matter to convert them for another machine. These programs should (in my estimation) occupy not more than 32k of RAM, and floppy disk drives are not essential.

The first part of the book is designed to get the reader thinking about the whys and wherefores of expert systems, and their limitations. After dispelling any misconceptions the book continues with an introduction to probability theory and Bayes' Theorem.

The middle section builds up in stages the framework of an increasingly sophisticated self-learning general purpose expert system. This system modifies its set of judgement rules according to the correctness of its answers. As new topics are introduced and explained they are incorporated in the expert system. Some of these topics are: parallel and sequential decisions, the description space, training the expert system and probability distribution functions.

For the reader who wishes to have a ready made expert system with which to impress others, there is a listing of a medical diagnosis program. This uses a Bayesian inference method and asks only the minimum number of questions needed to arrive at the best diagnosis.

Towards the end of the book there is a chapter dealing with some of the well established expert systems such as DENDRAL - used for determining chemical structures, and PROSPECTOR - used to help find valuable mineral deposits. Another interesting chapter discusses the languages to program expert systems.

To round off the book there is a summary of the important technical terms, followed by a list of recommended books for those who wish to delve more deeply into this field.

This book is written in a light, humourous style and the program listings are clearly printed. It should appeal to many hobbyists, especially those still wondering if the answer really is 42.

Apologies to those whose review has not appeared in this issue. We are short of space, but you should see your review in the next issue.

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We've taken the risk factor out of buying software! So much so that we are prepared to refund you the full purchase price on any of our Apple software products within 21 days of purchase if you're not satisfied with it! At present our range includes:

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An *essential package* for bookkeeping exercises, i.e. Sales Day Book with analysis by category, list of debtors with dates, etc. Purchase Day Book with analysis, Cash Book, Petty Cash Book, home accounts, etc. Bookkeeper takes care of VAT calculations and allows you to produce analysed and selected figures as and when required, ie. management figures, etc.

Access

A superb Apple II+/IIe database manager (DBM). Access has all the *power and versatility* you would expect in an Apple DBM, regardless of price. It is also very fast, for instance it will find an indexed item in approximately 3 seconds, and will retrieve a record with complex sets of criteria, such as AND, wildcard, range search, in less than 23 seconds. This package was previously available for £199.95 including VAT and even at that price users found it to be good value for money.

Payroll

This package takes care of Payroll calculations and record-keeping for the smaller business and will *handle all levels of pay*, tax codes (including NT No Tax) and National Insurance at standard, reduced, over pension age, or nil rates, contracted out or not. Payroll works with batches of 50 employees at a time and is being used, successfully, by companies with up to 100 employees, as well as larger organisations, for confidential processing. Only information which has changed since the last Payroll run need be entered - employee, tax and National Insurance details are stored. The Inland Revenue specifications are followed accurately, no error of calculation has ever been reported since the first version of Payroll was tested in 1980. Users have found that Payroll is very easy to use with very little knowledge of computers or payroll procedures necessary for successful operation. In addition to all usual calculations, Payroll will compute gross pay and deductions for a given net pay.

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Education

by Norah Arnold

PRE-SCHOOL & INFANT STAGE SOFTWARE.

During the last few weeks I have had many enquiries from people asking for advice about pre-school and infant stage software. Of course there are some good commercial programs about, but nobody gets bored as quickly as a 3 or 4 year old. This makes the purchasing of enough commercial programs to keep the child perpetually interested a bit of a problem.

From the enquiries I have received I gather that many people are buying up second hand Apple IIs as the previous owners of these machines buy Apple IIe's. This appears to be giving us a 'new generation' of beginners, eager and enthusiastic to get their children or grandchildren interested and started on computing.

I must be the world's greatest optimist. The last time I asked for early learning software to be sent in, the response could only be described as poor. However, there must be many people around who wrote short programs to help their child learn to count, to identify shapes, to tell the time or just to have fun, whose children are now well past this stage of learning, so I am going to stick my neck out and do it again.

If you have ever written any programs of this kind, however short, how about sending them to me via the P.O. Box? I would like to get a disk of programs together for the software library. Before you say to yourself that none of yours are good enough to send in, just remember that the people they are intended to help are complete beginners with no experience of programming, but who wish to help their children benefit from the computer they have purchased. A group like BASUG can only flourish if the members are willing to help each other. Please send a program in if you can and your disk will be returned.

TWO BOOKS ON EDUCATIONAL COMPUTING.

Title: The Academic Apple.
Author: Richard Mowe.
Publisher: Reston Publishing Co. Inc.
A Prentice-Hall Company.
Price: £9.30.

This is a handy little book for those who have just purchased an Apple and wish to use it to its full potential as an educational tool. The book is aimed at parents, teachers and anyone who works with young people and computers.

As the book is directed at beginners, the vocabulary has been kept as simple as possible, and there is a section on 'getting started' which clarifies and explains some of the terms that new computer users have to come to grips with. For non-teachers there is a section on what one can expect from a child at different age-levels and this includes a paragraph on 'attention span'. This is a very important point for parents, who are inclined to think that their four to five year old is 'not interested' if they cannot retain his/her interest in a computer activity for more than five to ten minutes. A short attention span is normal at this age and children need many short, varied activities to keep up their interest.

There is a section which discusses the different types of educational software available, such as tutorials, drill and practice programs, simulations, games and programs to improve one's productivity such as word processors and spread sheets. This section concludes with pointers to help in the choice and assessment of educational software, ie. is it educationally sound, easy to use, well documented, interesting to the child and lastly, does it exploit the unique abilities of the computer to good advantage?

The section on learning to program is a most realistic account of the problems one encounters and the frustrations that are met by those who start out to teach themselves to program. Following this are twelve lessons and worksheets which teach specific points in regard to BASIC. The section on writing software is also very 'down to earth' and some valuable points are made regarding the designing and testing of programs.

Learning to type, both how to type and the age at which children should learn, is discussed in detail together with a summary of typing tutor programs available. Following this is a chapter on the use of a word processor. This chapter specifically refers to Applewriter II. Five short lessons and worksheets on Applewriter are included. These will not take you very far but will at least

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ASK FOR DETAILS

get you feeling confident enough to tackle some of the intricacies of Applewriter II.

Most people who are just starting to use an Apple II would benefit from reading this book, especially if they are considering using the computer with children. It is definitely for those at the beginning of the journey, however, rather than those who are well on the way.

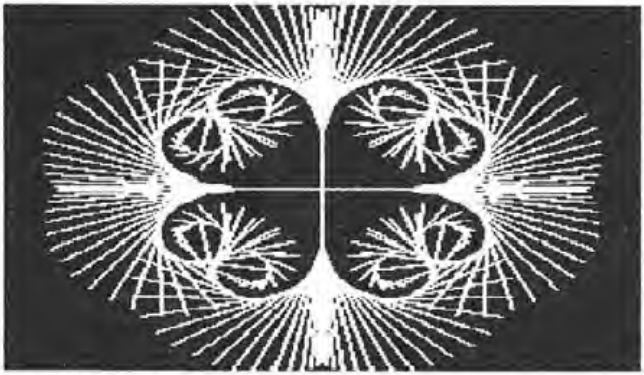
Title: The Turtle's Source Book.
Authors: Bearden, Martin and Muller.
Publisher: Reston Publishing Co. Inc.
A Prentice-Hall Company.
Price: £18.65.

I can't really begin to describe the appeal that this book has for children interested in LOGO, and for most LOGO-addicted adults too. The illustrations are just right to catch the children's interest and once started, the children that I used it with just didn't look back.

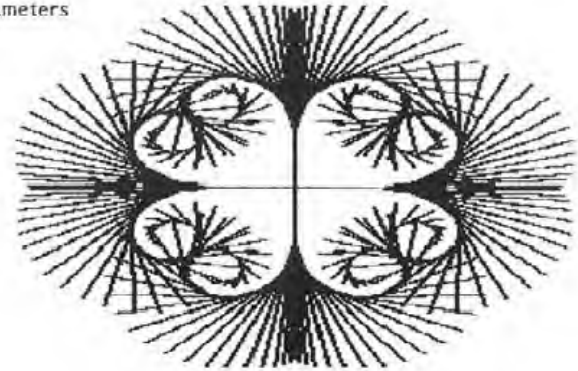
There are many useful ideas in this book for teachers using LOGO. The clearly printed command sheet pages were well used and the children were especially taken with the idea of Turtle Town, which was a great success.

The authors have taken into consideration many versions of LOGO and Apple users with M.I.T.(Terrapin) LOGO or Apple LOGO will find their needs catered for. The book concentrates almost entirely on turtle graphics and the word and list processing commands of LOGO are discussed only briefly. It is, however, a thorough introduction to turtle graphics covering the use of variables in LOGO and recursive procedures.

There are a few misprints but these only spurred the children on. The way they reasoned was that if the book makes a mistake or two it doesn't seem to matter so much that you do too. The book is not designed for a young child to use entirely on their own but to work through with the help and guidance of an adult. It would be a good buy if you have children starting on LOGO.



Printout from the SWIRL procedure from the Turtle's Sourcebook, with the parameters Distance 95 Angle 1.



Beginners' Page

by John Sharp

GETTING IT RIGHT ON THE SCREEN

There are many little things that add polish to a program. There is nothing so disconcerting to me as to have a program run and the first line to come up half way down a page. The listing or whatever has gone before has not been removed and it is difficult to know what you should be reading. It is simple to have the first line clear the screen and set the cursor up to the top left. This is easily accomplished by having the first line of your program:-

```
10 TEXT:HOME
```

This also helps if you have been editing using POKE 33,33, because it sets the text window back to normal.

Whereas it is easy to put text into programs, it is not always easy to have it laid out the way you want it to read. One of the most common errors I have seen is the overrunning of a word from one line to another, so that it is split. The effect is something like:-

```
THIS IS AN EXAMPLE OF HOW A LINE THAT SO
MEONE HAS TRIED TO FIT ONTO THE SCREEN L
OOKS
```

Not only is it difficult to read but it takes some of the polish from your program. How can it be overcome? Well, the easiest way is to look on the screen. If you are typing in a BASIC line for a PRINT statement then you open quotation marks to begin a string. When you come to the next line, as soon as the string comes in line with the quotation marks, you would be printing on the next line when you actually ran the print statement. So leave a few spaces if the word is going to go past the place where the quotation marks sit on the line above. This all sounds difficult when you are reading it so here is an example:-

```
10 PRINT "THIS IS HOW TO GET A VERY AWKW
ARD LOOKING STATEMENT PRINTED ON THE SCR
EEN"

20 PRINT "THIS IS HOW TO GET A VERY AWKW
ARD      LOOKING STATEMENT TO PRINT COR
RECTLY BY LEAVING A CORRECT NUMBER OF SP
ACES."
```

If you ran these two lines, then the first would have part of the 'looking' on one of the screen lines and part on the next one. Line 20 would be all right. There is a snag if you try to edit, using POKE 33,33 as in the last issue. The best way then is to run the line when you have altered it and go back and insert a few spaces to make it come right.

FINDING OUT WHERE A MACHINE CODE PROGRAM ON A DISK HAS BEEN PUT INTO MEMORY

The Apple has to know what it is doing with all the information it is processing and so it has to keep some sort of list of where things are, such as where a program is in memory, or where it has stored the variables in a program. Such items in a list are called pointers. When you have loaded a machine code program for example, there are some locations in memory that know exactly where it went. We can use these and some others to find out the length, in order to know for example how to save the machine code to tape.

The two locations that contain the information where the program starts are (in hex) AA72 and AA73 and the locations where the length of the program is stored are AA60 and AA61.

Now when the first microprocessors were designed there was a specific request from the customer that if a two byte number was stored in two successive locations, it was done the wrong way round i.e. that the low byte (often called the least significant byte or LSB) was stored first and the high byte (the MSB or most significant byte) was stored second. This continued to the later processors for no logical reason. This means we have to be careful when we interpret the values of the numbers in the two locations. As ever, an example is far easier to understand so let us take one. Suppose you want to look at the starting address of a binary file. From BASIC, BLOAD the program and then go into monitor with a CALL -151. Now list the two locations AA72 and AA73 by typing:-

```
AA72.AA73
```

and press RETURN.

This will result in the contents of these two locations being displayed like this:-

```
AA72- 03 08
```

This tells you that the program starts at

the hex location 0803 (remember! - reverse order).

Similarly if you list the contents of locations AA60 and AA61 by typing:-

AA60.AA61 and pressing RETURN

and you get the result

AA60- 00 08

this tells you that the program is 0800 bytes long.

Now if you want to load the program onto tape, you must add these two together. It is easy to make a MISTAKE. If you add the two numbers together you must take one from the result. Why? Well, suppose the length of the program is 5 bytes and starts at 800 hex; the program lies in the locations 800, 801, 802, 803 and 804, i.e. in 5 locations, the last one being 804 = (800 + 5) - 1. It is not too serious a problem, since it is better to have too much of the program than too little.

AFTER POKE 33,33 IT'S POKE 33,28

If you list a number of commercial software programs you often see a REM statement in a nice little box like this:-

```
10 REM  ************************
        *                      *
        *   THIS HELPS TO      *
        *     DRAW  YOUR       *
        *     ATTENTION        *
        *   MORE THAN THE      *
        *    USUAL  REM        *
        *     STATEMENT        *
        *                      *
        ************************
```

It takes a lot of work to get it right because having typed the line in, when you list it (remember, it's the listing rather than the printing that you want to look right in this case) the monitor alters the spacing, which is why editing requires POKE 33,33 as described in the last issue. However, Michael Mathison discovered by accident that if you POKE 33,28 then type in the box as you want it, when you list normally (i.e. having set the text window to normal either with a POKE 33,40 or by typing TEXT) it will come out just as you want it to.

****

If you have any problems or any solutions which would be suitable for this column, please send them to the editor. After all, we were all beginners once, and still are in some respects because no one can know everything about all aspects of programming.

****

BEGINNERS' TIP.

Many beginners ring us to say that they have just keyed in their first program but when they have tried to run it, strange things have happened. Has this happened to you? If so, have you typed FP or NEW after booting the disk? If not, there is a HELLO program still in memory which will be interlaced with yours.

Apple Prices

On the 24th April, Apple unveiled their new portable computer, the Apple //c. Weighing only 7.5 lbs the new machine is compatible with most of the existing software that is available for the Apple // range of machines. (For a first impression of the machine see the article elsewhere in the journal).

The other important news coming from the company is the new price list. As this runs into 10 pages we shall only give details of some of the more interesting ones.

Apple //c 128K	925.00
Apple //e 64K	587.00
Apple /// 256K	1995.00
Macintosh 128K with Macwrite and Macpaint.	1795.00
Profile 5Mb Hard Disk	1100.00
Floppy Disk Drive (143K Capacity)	230.00
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Mouse //c (with Mousepaint)	70.00
Mouse //	135.00
Prodos Users Kit	35.00
Appleworks Word Processor, Database & Spreadsheet Program.	175.00

Most of the announced programs for the Macintosh are priced at £99 or £149. Finally all Lisa prices appear to remain unchanged. For further details of other prices contact your local dealer.

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Printers

Daisy Wheel Printers

As promised in the last issue, I am going to outline some of the basics of daisy wheel printers. Because of space restrictions, the glossary of printer terms will have to wait until the next issue.

Daisy wheel printers are derived from the development of typewriters. Early typewriters used individually controlled mechanisms for each letter (or 2 including the 'shift'). This kind of arrangement was inherently slow, and the standard 'QWERTY' keyboard was designed deliberately to limit the speed of typists. (I understand that the //c uses optionally the 'DVORAK' arrangement, which is designed for maximum speed of input).

Early electric typewriters used this mechanism which limited not only the speed, but also the typestyle to that of the original manufacture. IBM introduced the 'golfball' system which allowed faster speeds and the changing of the typeface. The mechanism was still quite complex, with a surprising number of moving parts. The daisy wheel is a direct descendant of this idea. It is so called because of the shape of the wheel on which the characters are held. (The NEC Spinwriter uses a 'thimble' rather than a wheel, but the principle is the same.) The wheel itself is normally removable, allowing for different sizes and styles of print.

The advantage of the daisy wheel printer is that it allows extremely high quality. Hardcore is produced using a daisy wheel printer to give the highest possible quality of print. As with all engineering, in order to achieve this high quality, there are some trade-offs. These are versatility, noise and speed. Because a new wheel is needed for each style with a price of, typically, £12 - £18 each, not many styles tend to be used. The style that is used for Hardcore is called Madeleine. Other styles you may spot from time to time are :-

This is 10 pitch Courier

This is 12 pitch Letter Gothic

The Madeleine font is what is called a 'proportional' font, that is, the width of each character is different, as opposed to a 'monospaced' font, where each character has approximately the same width. Proportional spacing is generally considered to be easier on the eye because the words are more solid. It also allows more letters to be put in the same space. e.g.

iiiiiiiii (proportional)
iiiiiiiii (monospaced)
mmmmmmmmm (proportional)
mmmmmmmmm (monospaced)

Some word processors such as Wordstar claim to support proportional spacing, when what they actually use is proportional word spacing. This means that the 'white space' between words when fill-justifying a line is evenly distributed between the words.

Here is a sample paragraph, printed first as Applewriter would print it, monospaced and fill-justified with whole spaces. Next on Wordstar, with monospacing but proportional word spacing, and finally in the style that we use in Hardcore, with full proportional letter spacing, and word spacing.

Here is a sample paragraph, printed first as Applewriter would print it, monospaced and fill-justified with whole spaces. Next on Wordstar with monospacing but proportional word spacing, and finally in the style that we use in Hardcore, with full proportional letter spacing, and word spacing.

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Word processors that support full proportional spacing on daisy wheel printers include Format 80 and Gutenberg. Two that include proportional justification are Wordstar (if you have CP/M) and Letter Perfect. This degree of control of the printer is available because the Qume and Diablo models which are the most important for software support, allow absolute

carriage movements in units of 1/120th of an inch. Most Dot Matrix printers do not have such commands. One honourable exception is the Centronics 737/9 on which Hardcore used to be prepared, another being Epson's new LQ1500, and of course Apples own Imagewriter. Printers such as the Epson FX80 have a proportional character set, but without very complex programming proportional justification cannot be achieved.

Because very small movements of the head can be made, graphics can be produced of a very high quality, although the aspect ratio is usually wrong, and it can be very slow, as each dot is produced by printing a full stop character. The character set of the Apple LQP, which is an Apple modified Qume II, is specially designed to allow faster printing of graphics than most daisies. Intensive use for printing graphics means a lot of wear on the full stop character, so on some machines these are made of metal.The diagram of the daisy wheel was produced on Logo, and printed on the Ricoh RP1300. You may notice how the picture has been stretched sideways in printing.

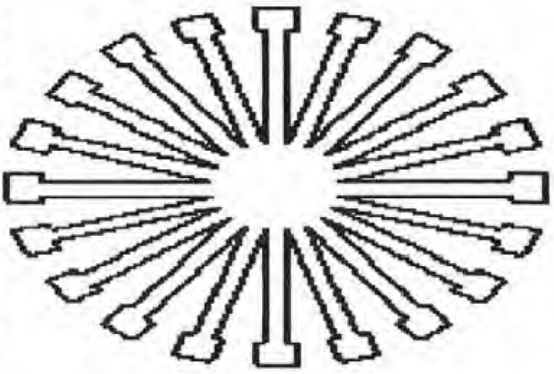
Ribbons are normally of one of three types, fabric, carbon single-strike and multi-strike. Fabric ribbons are the cheapest to use and consist of a loop of ribbon saturated with ink. Their life is limited by the faintest image that you can accept. They are good for first drafts and 'in-house' use. Single strike ribbons consist of a fine transparent backing with an even coating of carbon. The impact of the character transfers the carbon to the paper, and the ribbon is moved on by the width of the character. This gives the highest possible quality, but at the highest price. Multi-strike is a compromise. The same basic principle is involved, but the coating of carbon is thicker, and the advance after printing a character is smaller, typically about 1/4 - 1/6th of the width of the character. While costing slightly more than single-strikes, they last many times more. Specialist ribbons include red or red & black for printers that support two colour effects, and correctable types for machines that can be used as typewriters.

The use of typewriters that can be used as printers and vice versa is increasing with companies such as Brother and Silver Reed who have made typewriters for many years. When looking at printers that can have keyboards attached, it is important to check that the keyboard can communicate fast enough with the printer. One or two models cannot keep up with a fast typist.

As with dot matrix printers, so paper feed is important on letter quality printers. All models, as far as I know, have friction feed, which means that printed stationary can be used. It does mean that each sheet has to be put in by hand. Tractor feed, so that labels and forms can be accurately fed, are normally available as an option (often more than £100). Single sheet feeders, which will automatically feed a new sheet of paper when necessary, are again extra - a simple one will cost from £220 (for a Brother HR15) up to over £500. More sophisticated feeders incorporate more than one hopper, so that a choice can be made for example between headed paper, continuation sheets and envelopes. The cost of these is very high.

The major disadvantages of this type of printer are speed and noise. Typically the speeds vary from 10-12 characters per second up to a maximum of 65-70. The actual throughput is often faster than dot-matrix printers because there is often a facility to skip over spaces at high speed, and they often have faster Line/Form Feed.

Next Issue - An Illustrated Glossary.



Local Groups

Birmingham Group.

MID-APPLE, the local area group for Birmingham and the West Midlands, are now housed in superb premises for their monthly meetings. Membership of the club has grown over the last year and another influx of people is expected within the next month or two if the interest generated by their representatives at the Midland Computer Fair is anything to go by.

Jim Roden who runs a bulletin board has agreed to give a short talk on communications and demonstrate the new Digicom Panther modem to the MID-APPLE group in Birmingham on 8th June 1984 (date subject to confirmation). For details of the club contact Bill Watson on [illegible] or Mel Golder on [illegible].

London Area.

We are sorry to report that the South London Group has ceased operation due to lack of support.

We are hoping to set up a new local group in the much needed location of Central London. This could take place 'straight from work' so that commuters could stay on in London for meetings. This could solve some problems for those unable to get to a local meeting near where they live because they get home from work too late or because there is no local group in their area. Would anyone interested in joining please let us know as soon as possible. Michael Leeming has said that he is willing to co-ordinate such a club if enough members are interested.
Contact via the P.O. Box.

****

Other addresses:

Herts Group meets at:
The Old School
1 Branch Road
Parkstreet Village
St. Albans

Avon Group meets at:
The Woodborough
Winscombe

Kent Group is peripatetic.
Check with Jim Panks on [illegible]
or with Dougal Hendry on [illegible]

Croydon Group's last known meeting place:
The Shirley Poppy
Wickham Road
Shirley
Check with Paul Vernon on [illegible]

Small Ads

Apple Graphics Tablet	£230
Utopia Tablet Software	£20
Digitek Colour Card	£40
Bitstik	£160
Appleworld	£10
3D Super Graphics	£10
Bill Budge's 3D Graphics System	£10

Ring Tim: [illegible] evenings & weekends.

****

Apple //e system for sale. Still under guarantee. Includes 2 disk drives, dot matrix printer, CP/M, 80 columns, Wordstar and DBase II. Cost £2,500. Any reasonable offer considered.

Mr. Drakeford. [illegible]

****

Apple Serial Card for sale £25

Ring Martin: [illegible]

See p. 19 for more.

PLEASE NOTE:

If you are writing to BASUG and you have comments which apply to several different areas, e.g. a question on admin., a query to the software librarian and something for Hardcore, please put items for different people on separate sheets of paper. This means that each person will get your question or information quickly and ensures that all the items are dealt with. When a letter is being passed around, it is all too easy for it to be mislaid or for one recipient to be simply overlooked. It also takes quite a while for the last person to see your comments.

Exhibitions

Two of the 1984 shows are now under our belt and by the time you read this article the Apple 84 exhibition at Slough will also have passed. A full report of this main event in the (UK) Apple calender will be given in the next issue.

The one day ACC gathering at Westminster produced some good news and some bad news but few suprises. Robots were in evidence to a much greater extent than in previous times which seems to indicate a fast growing interest in the area of computing.

The bad news was the demise of the South London Group at Raynes Park due to poor attendances in recent months. The good news is a very strong possibility of a new group being formed within the Central London area in the near future. For further details, please contact Michael Leeming via the PO Box.

MID-APPLE, the Birmingham local area Apple users group, played host to the exhibition unit at the Midland Computer Fair in May. The show has now moved to the National Exhibition Centre but, as has been reported in the past, it is still a very small offering to present to the general public and is mainly a games fair. Whispers of discontent could be heard, not only from the visitors but from some of the exhibitors as well. An official responsible for the show said that they had tried everything they knew to get the more serious side of computing represented but have had little success.

A final word of thanks is in order to those of you who have helped. MID-APPLE representatives were Mel Golder, Bill Watson, Dave Ward, Colin Shirras and Ro. Thanks also to Michael Leeming at Westminster and Keith Chamberlain who just popped in to the Birmingham show on his way home from the North and stayed all day.

We are still collecting names for the London Fair at Earls Court on 14th to 17th June and the PCW show at Olympia London on the 19th to 23rd September. All members willing to assist for half a day or longer please contact us in good time.

Readers' Letters

Sunningdale, Berkshire.

Dear Yvette,

Fontrix.

To add to my Fontrix article, I quote from a letter received from Bob Van Arsdale answering my letter about Epson MX printers and the difference in horizontal/vertical scales compared with, say, the Apple DMP. This only shows if you are printing circles - for most type fonts it doesn't detract.

"Fontrix addresses the MX printers at a horizontal 120 dots per inch, and translates one dot on the screen to one dot at the printer (if printed with Magnification 1 of course). The vertical elongation you see is the result of differing horizontal v. vertical dot spacing (Vertical advance is set to 16/216 inches, resulting in an approx. 1/3 dot overlap every print pass, thus achieving the greatest visually acceptable degree of vertical compaction). At this juncture we have no means of changing the graphics aspect ratio, although we are looking into means of specifying vertical and horizontal magnifications independently".

I hope this is of interest to our Epson users who appear to be the majority! By the way, he mentions that they are working on updating Graphtrix to work with Applewriter I and //e but don't expect it before the autumn.

Gutenberg.

I wrote to the author of the Gutenberg Wordprocessor programs to find out what the general position was regarding supported printers and whether there were any updates. The author, John Wagner, has replied as follows:-

"Gutenberg JR (the junior version) is available for four different printers:-
1) Apple Imagewriter
2) Epson MX-100 and FX-80 compatible
3) NEC PC-8023A-C
4) C.Itoh Prowriter.

A user-configurable print-driver for

Gutenberg JR will be available with the release of the new Gutenberg SR (New Senior) in May or June 1984. The documentation for configuring the print driver is extensive, since it will allow you to configure your system to any printer".

A Gutenberg Newsletter will be published in May/June and the program update policy will be stated there.

Yours sincerely,

Peter Trinder.

Maldon, Essex.

Dear Sires,

The recent introduction of Basicode and the Hardcore article by Nik Kelly on Apple/BBC communication made me decide to have a go at transferring data between the two. I have an Apple communications card and just the normal RS423 on the Beeb.

My efforts to implement Nik's routine failed miserably, though I have managed to get Apple to Beeb communication via the RS232 card and RS423 on the Beeb. Even so, a return on the Apple promptly results in half of double size characters appearing on the Beeb (? inadvertent mode change). After all this, I thought to myself that there could be a possibility of transferring data (text) files between the two by recording from the Apple Communication Card to tape and feeding the results (if any!) into the BBC tape socket (which they say utilises the RS423 chip). There is just one snag, I really don't have the know how to work out the detailed format necessary.

Can anybody advise me? Or perhaps it would be worth an article in Hardcore.

Yours sincerely,

Dr. P. J. Baron.

Linthorpe, Middlesbrough.

Dear Editor,

I have been interested to read the recent correspondence on using both sides of single-sided disks.

While I accept the theoretical reasons for not doing so, I can only quote my own experience which is to use both sides of inexpensive disks fully. I have been doing so for over a year now, with no sign of problems from disks or drive.

Incidently, my drive is a Cumana, which I highly recommend for its silent reliable operation; and I would like to thank that company for a very full and helpful reply (including circuit diagram) when I had a query about adjusting the drive speed. May all companies be so helpful!

Yours sincerely,

Dr. John Marr.

Tabuk, Saudi Arabia.

Dear BASUG,

Could you please give me some more information on disk 86, BBC to Apple.

I have built the RS232 board described in the Blacksburg book 'Apple Interfacing' which uses an 8251A USART. Has anyone written software for it?

Yours sincerely,

G. W. Ferguson.

/Ed. -The disk 86 was explained in a lengthy article in Hardcore vol. 3 no. 5 (Oct '83) so I suggest you get a back issue from Fran as this is probably the best information we have./

Washington Apple Pi
Bethesda, U. S. A.

Dear Sir or Madam:

We would like to be able to offer our 4000 members timely information on events of interest to microcomputer owners in general and to Apple owners in particular. News of troubles and triumphs of both user groups and individual members, national and local

government activities affecting micro owners, problems of ownership, themes and dates of forthcoming meetings (our members do travel a lot!), all would be appreciated and used in what we hope will be a monthly column of our journal.

We will welcome communications from individual members. Letters and tearsheets of news stories (please make sure the paper and the date are clearly identified) will both be appreciated. In all cases proper credit will be given to the sources. We will not be able to use any items to which we cannot attach the name of a source, or material we fear to be libelous.

The material should be sent to:

Bob Kosciesza
c/o Washington Apple Pi
8227 Woodmont Ave., Suite 201
Bethesda MD 20902

The deadline for receipt of the material is 25th of each month.

Sincerely,

B. Kosciesza.

Port Talbot, West Glam.

Dear BASUG,

I am sending details of the Federation of British Tape Recordists (FBTRC) in the event that any of your members might be interested.

Yours sincerely,

Revd. William G. Rees.

/Ed. -I have this. Anyone wanting it please contact me./

Sunningdale, Berks.

Dear Sir,

ProDOS

When converting files to ProDOS the CONVERT program kindly adds a period to multinamed filenames but it doesn't scan the actual file for multinames so the user has to alter these.

If you use a Menu Program like the DISK MENU program in the Applesoft manual then the name of the program in the menu is read into TITLE$ and used directly to RUN any called program, and if the contents of TITLE$ contains spaces then it crashes to program.

To get over this we added the following lines:-

```
9070 TL$ = ""
9071 FOR I = 1 TO LEN (TITLE$) :
       IF MID$ (TITLE$,I,1) = " "
       THEN TL$ = TL$ + ".":GOTO 9073
       TL$ = TL$ + MID$ (TITLE$,I,1)
9073 NEXT I : TITLE$ = TL$
```

We hope you all find this routine useful.

Yours sincerely,

Michael Trinder.

Brighton, East Sussex.

Dear Editor,

I have been using the SHAPE DESIGNER suite of programs from the BASUG introductory disk and have found them very useful. However, I have noticed that a few problems occur when the shapes that are created are assembled into a shape table using the program SHAPE-DESASSEMBLER (selected from option 2 on the main menu of SHAPE DESIGNER).

1. The shape assembler asks the user to input a decimal memory address for the shape table to start at, and recommmends 4096. If I follow this advice, the shape table that is created overwrites the end of the SHAPE-DES ASSEMBLER program in memory. This does not stop the program saving the resulting shape table to disk, but the end of the program does not execute correctly. I therefore recommend that the user inputs 24576 (i.e. just above high res page 2) for the beginning of the shape table when prompted by the program. The program SHAPE-PROG shows how the shape table can be loaded back into memory at a different addresss if 24576 is not convenient in any program written by the user.

2. I find that the last byte in the shape table does not contain zero when the shape table is loaded into memory just after the Apple is turned on, producing an incorrect pattern for the last shape in the table. I suspect this is because the program SHAPE-DES ASSEMBLER is not writing the last byte (0) of the shape table to the disk when the table is created. In any event, I have found that the problem can be remedied by changing (SH-1) to just SH in lines 640 and 710 in SHAPE-DES ASSEMBLER.

3. Some of the shape tables that I have created contain twenty or more shapes, and I find that SHAPE-DES ASSEMBLER does not clear a long list of shapes off the screen when it starts to load the individual shapes off the disk and draw them on the screen prior to creating the shape table. The result is that the titles printed at the bottom of the screen are obfuscated by the list of shapes. The remedy is to add the following line to the program SHAPE-DES ASSEMBLER:

545 HOME

I also have some requests:

1. Regarding the name of the journal 'Hardcore' somehow does not strike me as a particularly suitable name (no offence to the person who thought of the name, because I know how difficult it is to think of something original). What about something more mundane like 'The BASUG Journal' or 'BASUG Bulletin'.

/Ed. -There was a good deal of correspondence on this in the early issues of the magazine. If you really feel strongly about this, put it forward as a proposal at the AGM./

2. Please can you leave blank margins on your software library lists which you send out from time to time? It is difficult to punch holes in these without loosing some of the text. In fact, can you leave margins on all loose sheets (updates, etc.) that you send out? This would make filing in ring binders easier.

/Ed. -We leave as big a margin as we can but in order to get the information on as few sheets as possible (to keep costs down) it is not realistic to make margins too wide. Of course, if anyone is willing to subsidise our printing costs..../

3. I thought the journal article on the electronic mail communications software for the Apple was very useful, and hope to use the BASUG bulletin board when my wallet can stand the strain of buying a modem/serial card/software. How about a similar article on communications software for the Apple running CP/M? There must be a very large amount of public domain CP/M software available from CP/M bulletin boards, and a modem link with appropriate CP/M comms. software would allow this to be uploaded easily. This would get around the problem of incompatible disk formats which stops Apple CP/M users from getting more public domain software unless they have access to the other make of machine and a direct RS-232 link. If possible, please review the Z-Term comms. software, or any other CP/M comms. software for the Apple that you can get hold of.

/Ed. -Any offers to write on this?/

4. On the subject of modem communications, I would be grateful if any BASUG member could write to Hardcore and let me know whether there are any databases which are accessible to the general public (whether free or for a moderate fee). I am particularly interested in using the Apple to dial up a library database and search for journal abstracts and references. Come to that, I would also like to dial up a mainframe and use it for programming and running large number-crunching jobs. I know that the latter is available in the UK but I have not heard of a library database accessible to the public. In the States there are several, but the cost of the 'phone connection then becomes prohibitive if used regularly.

Keep up the good work.

Yours faithfully,

W. J. Hill.

LLandudno.

A word of warning for potential 80-column card purchasers:-

(after the Feb 84 Hardcore Vision-80 review)

The Digitek Screen-Master 80 eighty column card does not support user-defined characters (unless you have an EPROM burner that is). The character set is stored in an EPROM along with a graphics character set

(which isn't very good). I think Digitek would have had an even nicer 80-column card if they had swapped the EPROM for a RAM chip (maybe CMOS). Apart from that and the manual, the Digitek is an extremely attractive video board with a very clear display (on my BMC green-screen VDU) with well-formed characters that are easy on the eyes. The Vision-80 & Screen-Master 80 cards seem to have a great deal in common (including the ludicrous Copy protected demo disk).

My 80-col card worked perfectly (except that you couldn't copy the screen to a printer or link the output on the screen with the printer - but that was probably my interface's fault). The Digitek card gives you three different text scrolling speeds:-

Normal, which is crystal clear and SLOW.
Fast, where direct memory access is allowed (display flickers a bit).
Very Fast, where DMA is allowed with something else in the card helping the 6845 display chip (flickers a great deal).

The manual spoke of a "Visual Shift Lock Indicator" which does not exist on my card (the card makes little bleeps and bloops when you shift-lock & cancel shift-lock). The manual also shows a picture of a very nice Screen-Master 80-column card, however it's not the same as the one I've got inside my Apple. Some people would say "Why don't you write to Digitek & protest in the STRONGEST terms" - but the card works, & it does what I want it to. I never had the problems described in the Hardcore Vision-80 review. My card shows no signs of any communications capability, and where the Vision-80 manual apparently says you must connect the card to the Apple's video output, the Digitek manual says that if the connector from the Apple's video output to the card is disconnected & the Apple's video connected to one monitor with the card attached to another, twin monitor display is possible (but not many people would want to bother! Colour would be much more interesting).

The only real niggle I've found with the Digitek card is that when you're typing text in, the machine will slip in-and-out of CAPS-Lock which can be a real pain when you're writing a Basic program in 80-columns. You can keep an 80-column screen static while you RUN a Basic program (so if you've not finished debugging a program, that's a godsend). You can also "preview" printouts on the 80-column card, because it uses proper ASCII code, not the Apple screen codes.

Martin Hamilton.

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DIARY

June

5th Herts Group - BASUG Special Release Software. 8pm.
8th Mid-Apple (Birmingham) Group. 8pm.
Talk and demonstration on communications.
11th Hants & Berks Group.
14th - 17th London Fair at Earls Court
16th BASUG AGM - Central Institute, Longford St., London NW1
Workshop 10am to 5pm. AGM starts 3pm.
18th Croydon Group - High Res Graphics effectively programmed. 7pm.
26th Avon Group

July

3rd Herts Group - Steve Collins on Wizardry. 8pm.
9th Hants and Berks Group.
13th Birmingham Group 8pm.
16th Croydon Group - Financial packages; Comparative evaluations. 7pm.
31st Avon Group.

August

7th Herts Group - Games evening, bring along your best new games and a machine too if you possibly can. 8pm.

September

17th Croydon Group - First line maintenance of Apple systems. 7pm.
19th - 23rd PCW Show at Olympia, London.

October

15th Croydon Group - Music on Apples, e.g. Zapple.

November

19th Croydon Group - Word Processing packages compared.

December

17th Croydon Group - Adventure Games: Philosophy of design.

If you would like your events in the diary, please write in and tell us about them.

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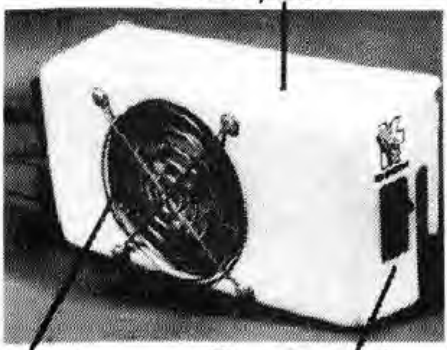

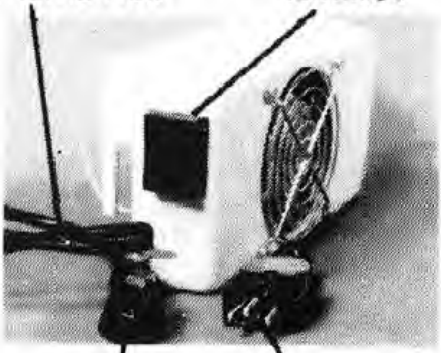

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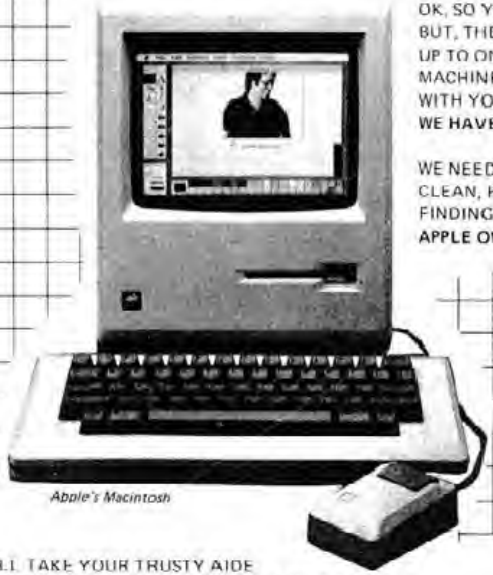

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